*The Future of
Burley Tobacco:
Potential Outcomes,
Points of Leverage and
Policy Recommendations*

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THE KENTUCKY LONG-TERM POLICY RESEARCH CENTER

PREFACE

This report identifies and suggests some potential outcomes over the next 10 years of various factors that are likely to affect the future of burley tobacco. These trends include, but are not limited to, increasing taxation on cigarettes at the state and federal levels, decreasing domestic cigarette consumption, declining levels of domestic content in U.S. manufactured cigarettes, and the increasing abundance of high quality (relatively cheap) burley in the world market. These trends are important to Kentucky because they can affect future burley quotas, which can have serious economic and social consequences for Kentucky's tobacco growing communities. However, Kentucky's policymakers can exercise varying degrees of leverage over these factors. Accordingly, we offer recommendations on courses of action.

The bulk of the research for this report was conducted during the spring of 1994 -- a period of turmoil and uncertainty for the tobacco industry. Since the release of the initial draft of this report, a series of important events have occurred that could significantly impact future burley quotas. For example, laws affecting tobacco imports have changed, national health care reform -- and a possible tax increase on cigarettes -- is defunct for the current session of Congress, and a Congressman from North Carolina has submitted a proposal that includes a provision to abolish the tobacco price support system.

Consequently, any forecast of the future burley quota is fraught with uncertainty. It is difficult indeed to determine what will happen over the next ten years. The results of this analysis are based on expert opinion gleaned from the vantage point of spring 1994. While it is impossible to be certain about the course of future events, one thing seems certain: the "tobacco industry" is on the decline -- the uncertainty centers on the magnitude of that decline.

KENTUCKY LONG-TERM POLICY RESEARCH CENTER

The Kentucky Long-Term Policy Research Center was created by the General Assembly in 1992 to bring a broader context to the decision-making process. The Center's mission is to illuminate the long-range implications of current policies, emerging issues, and trends influencing the Commonwealth's future. The Center has a responsibility to identify and study issues of long-term significance to the Commonwealth and to serve as a mechanism for coordinating resources and groups to focus on long-term planning.

Governing the Kentucky Long-Term Policy Research Center is a 21-member board of directors that includes four appointees from the executive branch, six from the legislative branch, and 11 at-large members representing citizens groups, universities, local governments, and the private sector. From the at-large component of the board, six members are appointed by the Governor and five by the Legislative Research Commission. In accordance with its authorizing legislation, the Center is attached to the legislative branch of Kentucky state government. The makeup of its board, however, affords it functional independence and permits it to serve both the executive and legislative branches of government equally, as well as the public.

Michael T. Childress is the executive director of the Center. Those interested in further information about the Kentucky Long-Term Policy Research Center should contact his office directly:

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CONTENTS

SUMMARY

*"There is no one big thing Kentucky farmers can
do to offset the loss of foreign markets for
tobacco, but there are many little things they
can do that in the aggregate will save them."*

- Dr. Thomas P. Cooper,
  Dean of the University   of Kentucky College of Agriculture,
  July 1940

Background

Tobacco's importance to the Commonwealth of Kentucky cannot be adequately understood by simply reciting the statistics on the number of tobacco farmers or tobacco's contribution to the state's gross product. Although these numbers are, in themselves, quite impressive, they do not reveal the extent to which tobacco is interwoven into the basic fabric of the state's history, culture and ethos. Indeed, tobacco is much more than a $1 billion a year economic activity that employs nearly 100,000 Kentuckians.

Tobacco is, in fact, an essential element in the cycle of Kentucky life, and forms an important thread of continuity with previous generations. While the technology surrounding the tobacco industry has changed, the basic activity has remained fundamentally the same for generations. In the same way that his great-great-grandfather spent his spring preparing plant beds and his winter stripping tobacco, today's tobacco farmer is connected in an intimate and fundamental way to his ancestors as he engages in the same activities, frequently cultivating the same land, and sometimes even using the same tobacco barns.

Kentucky's social, economic and cultural fabric, however, is beginning to show the strain from the increasing pressure placed on tobacco by several forces. As a way to help finance national health care reform, proposals have been made to substantially increase the federal excise tax on cigarettes. This could, if enacted, significantly reduce cigarette consumption, and thereby accelerate its downward trend in the United States. Moreover, while cigarette exports have experienced annual 15 percent increases for five of the last seven years, this trend will assuredly slacken as international competitors continue to produce high quality burley at low prices. Domestic content legislation, which took effect in January 1994, will help to stabilize tobacco quotas in the face of these pressures. At the same time, however, this legislation *could* result in a loss of jobs if value-added operations, like cigarette manufacturing, are moved to foreign locations to escape the requirements of the legislation. Meanwhile, research and development into extended uses for tobacco offer a ray of hope that innovative uses will spur new industries and cushion the downward pressure on tobacco quotas.

Purpose

The purpose of this research project is fivefold: (1) identify the factors that are affecting tobacco's future; (2) ascertain their likely outcome over the next 10 years; (3) delineate their potential consequences on future burley quotas; (4) understand the economic implications of a

changing burley quota; and (5) develop recommendations for policymakers that facilitate a best case scenario and hedge against a worst case scenario.

Research Approach

An extensive survey of the existing literature on the issues pertinent to the future of tobacco was conducted. Then, tobacco experts throughout the country were interviewed and asked to complete a questionnaire (7 experts were farm organization leaders, 6 were U.S. Department of Agriculture experts in the production and marketing of tobacco, 5 were university faculty with specialized knowledge of tobacco, 2 were economists working for (Kentucky) state government, 2 were agriculture specialists within (Kentucky) state government, 2 were with a tobacco advocacy and research organization, 1 was a private agriculture consultant, 1 was a tobacco warehouseman, and 1 was anonymous). The interviews and surveys were conducted during the spring of 1994.

The data collected from the interviews and surveys were used to identify the factors affecting tobacco and to estimate their likely outcome over the next 10 years. Multiple scenarios regarding Kentucky's future burley quota were constructed based on the anticipated trajectories of the factors affecting it. This method helps to identify the points of leverage in the tobacco system (i.e., which factors have the biggest impact on the system and which factors can be changed) so that recommendations can be offered to policymakers on courses of action.

Results

The alternative scenarios generated in this analysis focus principally on future quotas and implicitly assume that price support levels will remain relatively static. This is because growers have typically shown a preference to maintain price at higher levels and accept lower quotas when faced with pressure to accept either lower price support levels or lower quotas. This has not, however, always been the case, and the experience of the mid-1980s illustrates how growers have been willing to accept lower price supports in one instance. Indeed, many in the tobacco industry have suggested that the same could happen during the mid-1990s.

As a result, these alternative scenarios should be viewed as what *could* happen to future quotas given circumstances and expectations prevalent during the spring of 1994. These scenarios should *not* be viewed as the definitive and inclusive range of all possible outcomes. Obviously, if the Chinese market suddenly opened in a significant way to non-Chinese cigarettes (currently the Chinese market is largely closed to U.S. cigarette imports) then quotas in ten years could be at least as high as they are today -- or even higher. At the same time, if the Food and Drug Administration (FDA) takes action to significantly regulate cigarettes, then quotas could be substantially lower in ten years than those estimated in this analysis. Likewise, other events could occur, like major changes in the tobacco program or price support level, that could significantly alter the course of events. Presumably though, the probability of some of these events occurring should be implicitly captured by the "delphi approach" of soliciting expert opinion. For example, an expert forecast of future cigarette exports would certainly reflect the anticipation of changes in the status of the Chinese market access to U.S. produced cigarettes.

While there are many possible outcomes over the next decade for Kentucky's burley quota, this analysis suggests that significant structural factors will likely depress Kentucky's basic burley tobacco quota by around 40 percent over the next ten years -- resulting in the loss of 10,000 to 24,300 jobs. Moreover, *a decline of this magnitude is likely to occur even without a significant*

increase in the federal excise tax on a pack of cigarettes. The economic and social impact will be felt unevenly across Kentucky, with certain "tobacco dependent" communities especially hard hit. Nevertheless, Kentucky's policymakers can mitigate the potentially deleterious consequences of a declining burley tobacco quota.

Other noteworthy findings from an informal survey of tobacco experts include:

- Over 95% feel that there will be an increase in the federal excise tax on a pack of cigarettes. The consensus feeling is that this increase will be about $0.50;
- Almost 60% think that the tobacco growing states can obtain a portion of the funds generated by an increase in the excise tax in the form of a "tobacco rebate." Most feel that the likely percentage returned to the tobacco states would be around 3%;
- Nearly 90% of the experts believe that the domestic content legislation will not last because it is likely to be ruled inconsistent with the free trade provisions of the General Agreement on Tariffs and Trade;
- Approximately 75% of the experts anticipate that the manufacturers will move cigarette manufacturing operations "off-shore" as a result of the domestic content legislation. They also believe that significantly less U.S. grown leaf will be used in these cigarettes after production is moved "off-shore";
- Over 50% believe there is a "moderate" to "very high" probability that the tobacco price support system will be abolished within 10 years; and
- Almost 50% believe there is a "moderate" to "high" probability that foreign grown burley will match the quality of Kentucky burley within the next 10 years.

Policy Recommendations

Kentucky's policymakers and tobacco communities can simultaneously work to keep the burley quota as high as possible *and* attempt to cushion the blow of declining quotas by helping farmers diversify. Accordingly, we offer the following policy recommendations:

- *Work to enact legislation to have domestic content labeled on a package of cigarettes.* Approximately 50 percent of Kentucky's burley is used in the production of cigarettes that are consumed in the United States. Unsurprisingly then, the level of domestic content in cigarettes exercises substantial influence over Kentucky's burley quota. However, the domestic content legislation that took effect in January 1994, which is designed to increase the level of U.S. grown tobacco leaf in cigarettes, will likely be ruled inconsistent with the free trade provisions of the General Agreement on Tariffs and Trade (GATT). Pressure will then mount on the United States to abolish this legislation. While some elements of this legislation might legally remain intact under Article 28 of GATT, many believe that this legislation is accelerating the movement of cigarette production "off-shore." One consequence of a "shift" from the United States to foreign locations is the likelihood that significantly less domestically grown tobacco will be used in cigarette production. The same desired end (i.e., increasing domestic content) can be achieved through market forces if burley groups can capitalize on their comparative advantage of higher quality leaf, but this can only be done if domestic content is labeled on a pack of cigarettes.

- *Create a consortium of tobacco producing states to market leaf exports.* About 30 percent of Kentucky's burley is exported as unmanufactured leaf. As a result, the level of leaf exports exerts a major influence over Kentucky's burley quota. Until a few years

ago, the federal government provided this service under the Market Promotion Program. The tobacco producing states should fund market promotion programs to achieve this purpose. Also, Kentucky should consider a Farm Bureau recommendation to provide funding for an economist "to study and determine potential foreign market areas for Kentucky grown tobacco" (Kentucky Farm Bureau Policies, 1994).

- *Fund research and development that is focused on extended uses for the tobacco plant.* The tobacco plant holds tremendous potential as a source of high grade protein and as a tool for molecular biologists in bioengineering. While few believe that these extended uses will mature sufficiently over the next decade to significantly help tobacco farmers, there appears to be enough promise in these areas to warrant future research and development. Policy-makers should encourage this type of research at the state's universities by ensuring that funding is channeled in the necessary directions.

- *Facilitate farm diversification.* There is no single crop that can replace lost tobacco income. There are, nevertheless, opportunities available to farmers wishing to diversify. For example, conventional crops and livestock can be used to partially offset lost tobacco income. Moreover, supplemental crops and animal products, including, but not limited to, fruits, vegetables, aquaculture and specialty products can be pursued. A fundamental obstacle to farm diversification is a suitable infrastructure necessary for transporting, storing, and selling fruits and vegetables. Policymakers can help facilitate farm diversification by targeting rural development funds toward several different infrastructure investments. Some basic examples include coolers, storage facilities, and trucks to haul produce to markets. A specific example would include the proposed farmers' market in Northern Kentucky. By ensuring that projects such as this reach fruition, the state can play a positive role in facilitating farm diversification.

- *Develop a framework to increase local purchases.* Over 70 percent of the food consumed in Kentucky is brought in from outside the state. A significant marketing effort would be required, but Kentucky's farmers can help satisfy some of this consumer demand if the proper framework is developed. Policymakers can help develop a framework to increase local purchases by facilitating farm diversification and funding programs like farmers' markets and fruit/vegetable cooperatives. Moreover, the state can also engage in a "Buy Kentucky" campaign to publicize the benefits of increasing local purchases. Some of the ancillary benefits would include increased agricultural sustainability, higher "vegetable income" for Kentucky's farmers, fresher products for Kentucky's consumers, and ultimately a strengthening of Kentucky's rural economies.

- *Work to develop farm commodity exports.* In 1992, Kentucky exported $879 million in agricultural products, which is equivalent to 27% of the state's agricultural production. Unfortunately, while U.S. exports increased by 12% from 1991 to 1992, Kentucky's exports remained static. The largest increases on a national level were seen in wheat, soybeans, and live animals, and Kentucky has considerable opportunity for increased production in each of these areas. Accordingly, Kentucky's policymakers should ensure that Kentucky's agricultural strategic development plan, *Ag. Project 2000: A Comprehensive Master Plan for Kentucky Agricultural Economic Development,* receives adequate attention and support.

- *Focus attention on those communities especially vulnerable to a significant decline in the burley quota.* Some geographic areas of the Commonwealth will suffer severe economic distress as a result of a significant long-term decline in the burley quota. State government should recognize that these communities are in need of special assistance and extraordinary consideration. There are many state government programs designed to create new jobs, to retain and upgrade existing industries, to provide for the deployment of new technologies for the purpose of enhancing workers' performance and competitiveness, and to reverse trends of prolonged periods of area dilapidation and economic decay. Policymakers should ensure that any programs designed to accomplish economic revitalization can be applied to the communities identified in this report as particularly vulnerable to a significant decline in the burley quota.

GLOSSARY

ADD	Area Development District
ARC	Appalachian Regional Commission
BEA	Bureau of Economic Analysis
CBO	Congressional Budget Office
CFA	Community Farm Alliance
DCL	Domestic Content Legislation
FDA	Food and Drug Administration
FSW	Farm Sales Weight
GATT	General Agreement on Tariffs and Trade
GF	General Fund
OFM&EA	Office of Financial Management and Economic Analysis
Q1	First Quartile
Q2	Second Quartile
Q3	Third Quartile
REMI	Regional Economic Models Incorporated
TRRF	Tobacco Regions Reinvestment Fund
USDA	United States Department of Agriculture

ACKNOWLEDGMENTS

The Future of Burley Tobacco: Potential Outcomes, Points of Leverage, and Policy Recommendations

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→ • **Rationale**
  • **Approach and purpose**
  • **Factors affecting burley's future**
  • **Alternative scenarios**
  • **Economic and social implications**
  • **Policy recommendations**

This section explains the rationale of the study. Tobacco's importance to the Commonwealth of Kentucky cannot be adequately understood by simply reciting the statistics on the number of tobacco farmers or tobacco's contribution to the state's gross product. Although these numbers are, in themselves, quite impressive, they do not reveal the extent to which tobacco is interwoven into the basic fabric of the state's history, culture and ethos. Indeed, tobacco is much more than a $1 billion a year economic activity that employs nearly 100,000 Kentuckians.

Tobacco is, in fact, an essential element in the cycle of Kentucky life, and forms an important thread of continuity with previous generations. While the technology surrounding the tobacco industry has changed, the basic activity has remained fundamentally the same for generations. In the same way that his great-great-grandfather spent his spring preparing plant beds and his winter stripping tobacco, today's tobacco farmer is connected in an intimate and fundamental way to his ancestors as he engages in the same activities, frequently cultivating the same land, and sometimes even using the same tobacco barns.

Kentucky's social, economic and cultural fabric, however, is beginning to show the strain from the increasing pressure placed on tobacco by several forces. As a way to help finance national health care reform, proposals have been made to substantially increase the federal excise tax on cigarettes. This could, if enacted, significantly reduce cigarette consumption, and thereby accelerate its downward trend in the United States. Moreover, while cigarette exports have experienced annual 15 percent increases for five of the last seven years, this trend will assuredly slacken as international competitors continue to produce high quality burley at low prices. Domestic content legislation, which took effect in January 1994, will help to stabilize tobacco quotas in the face of these pressures. At the same time, however, this leg-islation could result in a loss of jobs if value-added operations, like cigarette manu-facturing, are moved to foreign locations to escape the requirements of the legislation.

Rationale

- **Kentucky is obviously a "tobacco state"**
  - **value of production in 1992 was close to $1 billion and tobacco is grown in 119 of Kentucky's counties**
  - **Tobacco grown on roughly 60,000 of the state's 90,000 farms (1987 census)**
    - » **most are small farmers**
- **The future is clouded with uncertainty**
  - **KY's basic burley quota continues to decline**
  - **price support program under fire**
  - **KY no longer sole supplier of high-quality burley**
  - **possibly facing a substantial increase in excise tax**
  - **declining numbers of smokers**
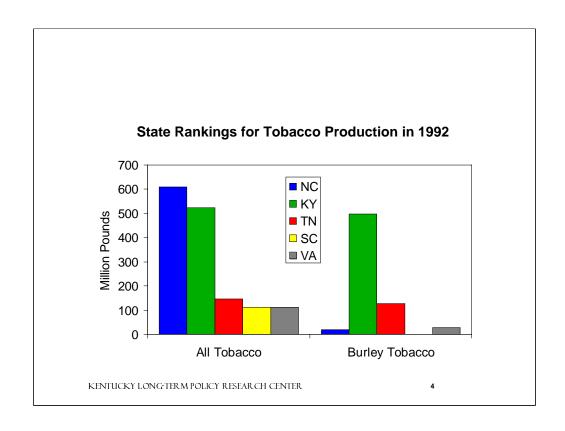
The rationale of this study is twofold. First, Kentucky is obviously a tobacco state. Second, the future of tobacco is clouded with uncertainty.
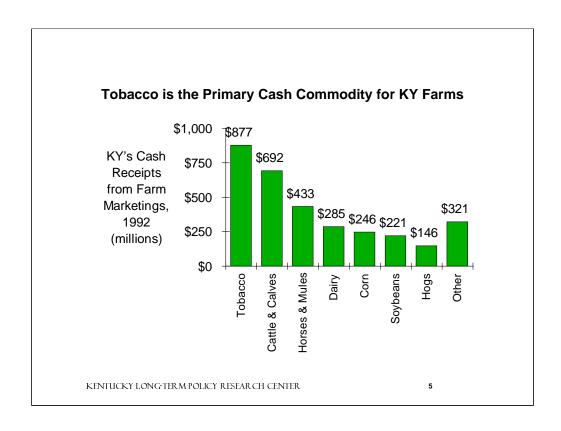
The value of tobacco production in 1992 was close to $1 billion, making it the state's primary cash crop. Moreover, it is grown in 119 of Kentucky's 120 counties (Pike county is the one county without a burley quota) and on two-thirds of Kentucky's farms -- particularly on Kentucky's smaller farms.

The future of tobacco, however, is clouded with uncertainty. The burley quota promises to continue declining, the price support program is under fire in Congress, there is an abundance of high quality and relatively cheap burley available in the world market, there is a high likelihood that there will be an unprecedented increase in the federal excise tax on cigarettes, and cigarette consumption is likely to continue falling among Americans.

State Rankings for Tobacco Production in 1992
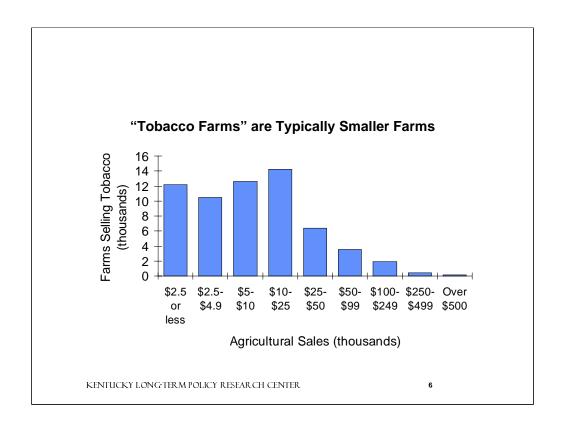
Kentucky is obviously a major producer of tobacco. This chart illustrates the tobacco production for the top five producing states. North Carolina and Kentucky are first and second, respectively, for all tobacco production. Kentucky, however, is the largest producer of burley in the United States. Indeed, approximately 95 percent of the tobacco grown in Kentucky is burley.

Source: *Kentucky Agricultural Statistics, 1992-1993,* issued by the United States Department of Agriculture National Agricultural Statistics Service and the Kentucky Department of Agriculture, p. 6.

Tobacco is the Primary Cash Commodity for KY Farms

KY's Cash Receipts from Farm Marketings, 1992 (millions)

Tobacco: $877
Cattle & Calves: $692
Horses & Mules: $433
Dairy: $285
Corn: $246
Soybeans: $221
Hogs: $146
Other: $321

KENTUCKY LONG-TERM POLICY RESEARCH CENTER 5

Tobacco is the primary cash commodity for Kentucky's farms. This chart shows the top seven farm commodities with the remaining commodities aggregated in "Other."

Source: *Kentucky Agricultural Statistics, 1992-1993,* issued by the United States Department of Agriculture National Agricultural Statistics Service and the Kentucky Department of Agriculture, p. 82.

"Tobacco Farms" are Typically Smaller Farms

Farms Selling Tobacco (thousands) vs. Agricultural Sales (thousands)

Most of the tobacco farms are small farms. This chart illustrates that approximately 80% of the farms with tobacco sales had total agricultural sales of less than $25,000.

Source: 1987 U.S. Census of Agriculture.

Kentucky's Basic Burley Quota Continues to Decline

Bar chart showing Basic Quota (million lbs.):
- 1991: 486
- 1992: 450
- 1993: 405
- 1994: 365

KENTUCKY LONG-TERM POLICY RESEARCH CENTER   7

This chart shows how Kentucky's burley tobacco basic quota has fallen in recent years. Since 1991 Kentucky's basic quota has fallen from 486 million pounds to an estimated 365 million pounds -- a decline of around 25 percent.

Source: *Kentucky Agricultural Statistics, 1992-1993,* issued by the United States Department of Agriculture National Agricultural Statistics Service and the Kentucky Department of Agriculture, p. 29.
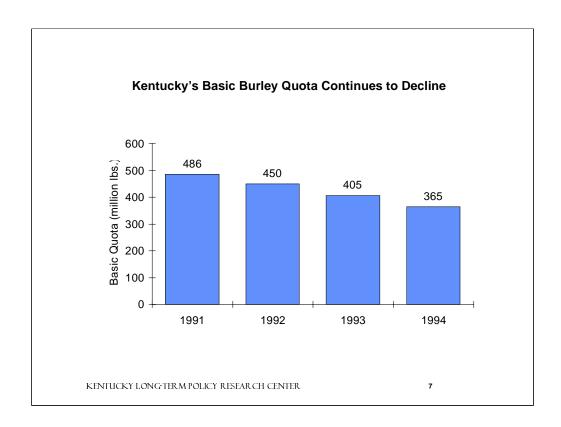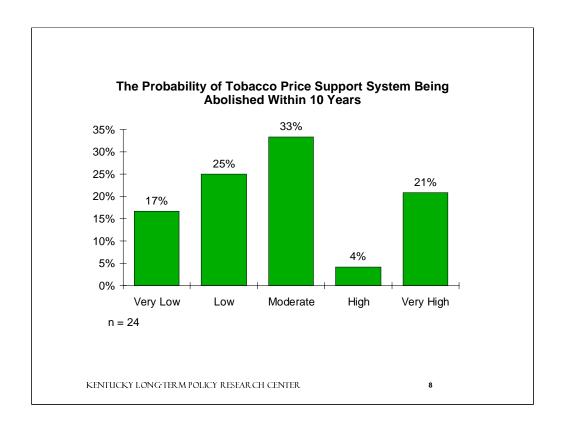
The Probability of Tobacco Price Support System Being Abolished Within 10 Years

It is accurate to assert that many within the "tobacco community" are feeling significant apprehension about the future of tobacco. This is evidenced by the chart above. The following question was posed to numerous tobacco experts who are involved in all facets of the tobacco industry:
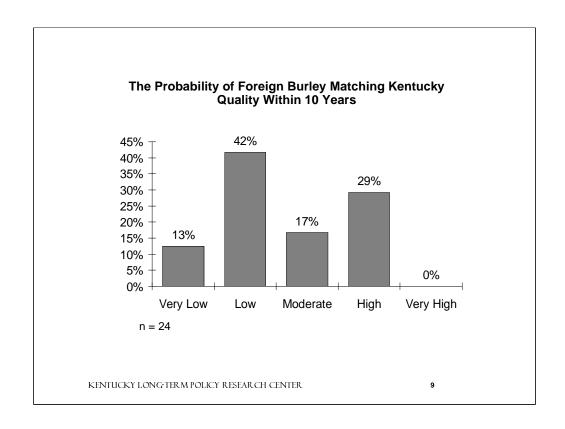
"Periodically bills are introduced in the U.S. Congress that are designed to eliminate the tobacco price support program. Using the scale below, how probable do you believe it is that the tobacco price support program will be abolished within the next 10 years?"

Respondents were asked to check one of five options: Very Low, Low, Moderate, High, or Very High (refer to Appendix A, question 24, to see the survey instrument).

A frequency distribution of the response from the 24 respondents is provided in the chart. The most striking element in this chart is that over 50 percent feel that there is a moderate to very high probability that the price support system will be abolished within the next 10 years.

It is not our contention that the tobacco price support system is likely to be abolished. Indeed, many have indicated that there will always be the option of using private funding to operate this system. Rather, we are simply trying to illustrate the degree of uncertainty and apprehension felt by many within the tobacco community regarding an important element of tobacco's future.

Note: These experts constitute a diverse group: 7 experts were farm organization leaders, 6 were U.S. Department of Agriculture experts in the production and marketing of tobacco, 5 were university faculty with specialized knowledge of tobacco, 2 were economists working for (Kentucky) state government, 2 were agriculture specialists within (Kentucky) state government, 2 were with a tobacco advocacy and research organization, 1 was a private agriculture consultant, 1 was a tobacco warehouseman, and 1 was anonymous.

The Probability of Foreign Burley Matching Kentucky Quality Within 10 Years
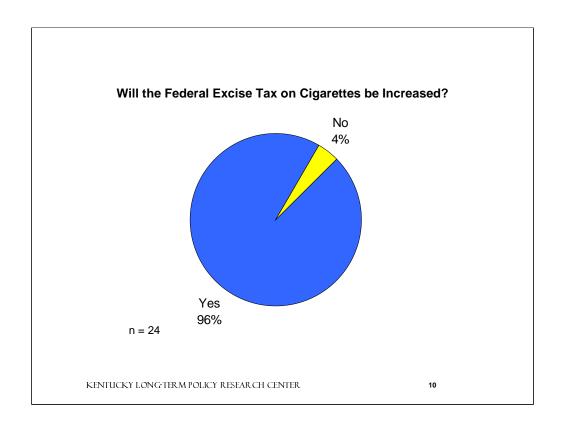
n = 24

This chart also demonstrates the apprehension and uncertainty felt by tobacco experts regarding the future of tobacco. The following question was asked of the same tobacco experts:

"Kentucky enjoys the distinction of growing the highest quality burley in the world. However, foreign producers have increased the quality of their burley tobacco in recent years. Using the scale below, how probable do you believe it is that burley produced outside the U.S. will be of equivalent quality to Kentucky burley within the next 10 years?"

Respondents were asked to check one of five options: Very Low, Low, Moderate, High, or Very High (refer to Appendix A, question 25).

A frequency distribution of the response from the 24 respondents is provided in the chart. Again, the most striking element in this chart is that nearly 50 percent feel that there is a moderate to high probability that foreign burley will match Kentucky quality within the next 10 years.

Parenthetically, it should be mentioned that there are really two issues associated with "quality." The first is that the foreign producers are gaining ground, and the second is that quality doesn't matter as much now because of the increasing sophistication of blending techniques. The increasing quality of foreign burley and sophistication of blending techniques have narrowed the taste difference between Kentucky burley and foreign burley. At the same time, cigarettes produced with foreign burley (i.e., the "generics") are significantly cheaper. Smokers in the U.S. have demonstrated a willingness to sacrifice a little quality for a significant price difference.

Will the Federal Excise Tax on Cigarettes be Increased?

No
4%

Yes
96%

n = 24
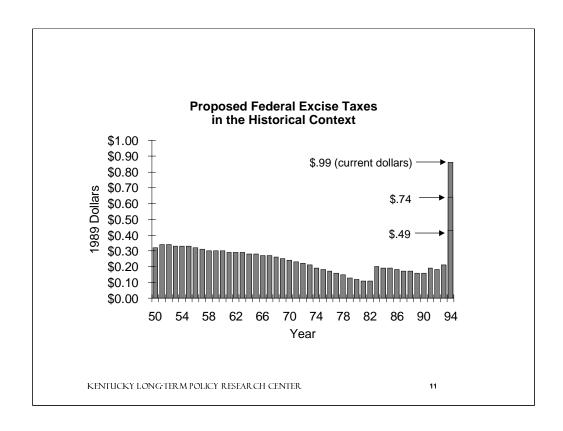
There is less uncertainty and more apprehension reflected in this chart. The following question was posed to the tobacco experts:

"Do you think there will be an increase in the federal excise tax on a pack of cigarettes?" (refer to Appendix A, question 1).
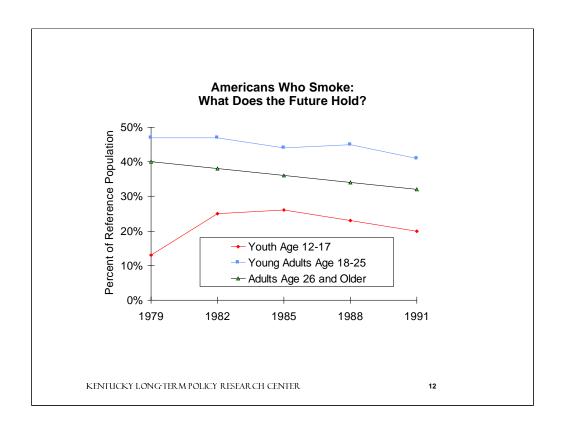
The pie chart above reflects their collective response. There is near unanimity that the federal excise tax on a pack of cigarettes will be increased. In many respects this is not a surprising result when one considers the broad base of support among the American public for a tax increase to help finance national health reform. For example, a *Time*/CNN poll conducted in April 1994 found that 58 percent of non-smokers felt that the tax should be increased to $1.25 (it is $0.24 now). When smokers' preferences were included, the percentage who felt that the tax should be increased to $1.25 was still over 50 percent -- an amount substantially higher than the $0.75 increase proposed by President Clinton.[1]

The real question, then, is not, "Will there be a tax?," but, "How large will it be?"

**Proposed Federal Excise Taxes
in the Historical Context**

This chart places the question of "How large will it be?" into a wider historical context. The bars from 1950 to 1993 reflect actual data on the federal excise tax for a pack of cigarettes (in constant 1989 dollars). The bar for 1994 reflects three different tax levels -- a $0.25 increase over the current $0.24 excise tax for a total tax of $0.49, a $0.50 increase to $0.74, and a $0.75 increase to $0.99. These three hypothetical increases -- $0.25, $0.50, and $0.75 -- reflect the most likely outcomes according to a group of tobacco experts regarding the current debate on whether to increase the tax.

Source: *Federal Taxation of Tobacco, Alcoholic Beverages, and Motor Fuels*, Congressional Budget Office, August 1990, p. 107.

**Americans Who Smoke:
What Does the Future Hold?**

These data illustrate how the number of Americans who smoke is on a downward slope. This, obviously, does not bode well for the tobacco industry. (These data reflect the number of Americans who have indicated they have smoked in the past year -- as opposed to the past month.)

Source: National Institute on Drug Abuse, National Household Survey, various years.

Outline

- **Rationale**
→ **Approach and purpose**
- **Factors affecting burley's future**
- **Alternative scenarios**
- **Economic and social implications**
- **Policy recommendations**

The study's approach and purpose are described in this section.

Approach and Purpose

- **Identify the factors affecting tobacco's future**
- **Ascertain their likely outcome over the next decade**
- **Delineate their potential consequences on future burley quotas**
- **Understand the economic implications of a changing burley quota**
- **Develop recommendations for policymakers**
  - **how can policymakers facilitate a best-case scenario and hedge against a worst-case scenario?**

The purpose of this research project is fivefold: (1) identify the factors that are affecting tobacco's future; (2) ascertain their likely outcome over the next 10 years; (3) delineate their potential consequences on future burley quotas; (4) understand the economic implications of a changing burley quota; and (5) develop recommendations for policymakers that facilitate a best case scenario and hedge against a worst case scenario.

The principal method used in this study for determining the likely outcomes of the factors affecting tobacco over the next 10 years is a delphi approach. The delphi approach for soliciting expert opinion is commonly used when traditional methods of deriving parameter values may not be appropriate. For example, there is a rich body of empirically derived research on the relationship between cigarette price increases and the resulting reduction in cigarette demand. However, these demand elasticities are derived from data that are probably not generalizable to the anticipated tax increase. Consequently, one would be guilty of extrapolating beyond the range by using these demand elasticities. Moreover, the "structure" of the tobacco system appears to be changing. In short, there is an abundance of foreign grown high-quality burley available on the world market that is relatively cheap. Also, anti-smoking regulations in the United States are achieving new heights. A quantitative modelling of the factors affecting the future of burley tobacco would entail modelling data of a different "era" and would therefore not reflect these apparent systemic changes. In contrast, the delphi approach allows one to circumvent the methodological problem of systemic change and extrapolating beyond the range by engaging experts and obtaining their perspective on these factors. Accordingly, an expert questionnaire was used, along with an extensive literature search, to determine expert opinion on the likely course of the many factors affecting the future of burley tobacco (see Appendix A).

These experts represent several different perspectives, including the universities, industry, growers, USDA, policymakers, and other interested groups/individuals (refer to page 8 for a complete description of the experts).

Their answers produce a range of possible values for the factors affecting the future of burley tobacco. For example, twenty-four experts responded to the question, "How much do you think this (tax) increase will be?" Their answers ranged from $0.00 to $1.00. The first, second, and third quartile values are $0.25, $0.50, and $0.75 (see

page 73, "Proposed Tax Increase: How Much is Expected?"). Distributions were created for all of the factors and the resulting quartile values were used in a quantitative model of the "burley" system to determine the most probable impact on future burley quotas. Using the example of the anticipated tax increase, the median or second quartile value of $0.50 was used to represent the "most probable" outcome. The first quartile value of $0.25 represents the "best probable" and the third quartile value of $0.75 reflects the "worst probable."

Developing Policy Recommendations

- **Focus on the factors with the greatest impact on future quotas and offer the most leverage**
- **Sensitivity analysis identifies factors with impact**
- **Questionnaire used to identify points of leverage**

In order to offer policy recommendations, it is necessary to identify those factors that have the greatest impact on the system and offer the greatest leverage.

This quantitative model of the burley system allows us to conduct a sensitivity analysis to identify those factors having the largest impact on the system. For example, will the likely annual rate of change in the number of Americans who smoke or the likely annual rate of change in cigarette exports have a bigger impact on future burley quotas?[2]   Sensitivity analysis helps us answer these questions.

The questionnaire is used to obtain expert opinion on which factors offer the greatest leverage. Leverage is defined as the opportunity for policymakers to alter the course of the factor. For example, according to the experts, Kentucky's policymakers would have more luck altering the course of domestic leaf content in cigarettes than they would affecting foreign cigarette consumption.

Outline

- **Rationale**
- **Approach and purpose**
→ - **Factors affecting burley's future**
- **Alternative scenarios**
- **Economic and social implications**
- **Policy recommendations**

Some of the factors affecting the future of burley tobacco are delineated and discussed in this section.

**Some Factors Affecting the
Future of Kentucky Burley**

- **Possible cigarette tax increase**
- **Domestic cigarette consumption**
  - **aggregate & per smoker**
- **Foreign cigarette consumption**
- **Domestic content**
- **Exported leaf**
- **Burley leaf in cigarettes**
- **Abundance of high quality (relatively cheap) burley in the world market**
- **Extended uses for tobacco**

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This chart lists some of the factors affecting the future of burley tobacco. There is, of course, the likelihood of a significant increase in the federal excise tax on a pack of cigarettes. This is important because it promises to have the impact of reducing cigarette consumption, and, in turn, the amount of burley needed for making cigarettes. Even without a significant increase in the excise tax, however, cigarette consumption is anticipated to fall in the United States both at the aggregate and per smoker level. Foreign cigarette consumption has helped replace the declining numbers of cigarettes consumed in the U.S., but the annual rate of change in foreign cigarette consumption (or cigarette exports) is expected to slacken. The level of domestic content in cigarettes is another important factor. An important element to domestic content is the status of domestic content legislation, whose longevity is somewhat uncertain. If domestic content legislation, or some altered form of it, remains in effect for the next several years, as some expect, it will have important consequences for the level of leaf exports and the numbers of cigarette produced in the U.S. -- both of which exercise an important influence on burley quotas. There are many other factors that could have an important influence on future burley quotas, including the level of burley leaf in cigarettes, the amount of tobacco used in cigarettes, the abundance of foreign grown (relatively cheap) high-quality burley, and whether any of the extended uses for the tobacco plant will have a significant impact on future quotas.

Outline

- **Rationale**
- **Approach and purpose**
- **Factors affecting burley's future**
→ • **Alternative scenarios**
- **Economic and social implications**
- **Policy recommendations**

Some alternative scenarios for future burley quotas are discussed in this section.

As previously described, frequency distributions for each of the factors affecting the future of burley tobacco are generated from the expert responses to the questionnaire. The quartiles are identified and the tails of the distributions are truncated in order to dampen the influence of egregious outliers. Then, these values are plugged into the model to produce the alternative scenarios: "Q1 - First Quartile," "Q2 - Second Quartile," and "Q3 - Third Quartile."

The alternative scenarios generated in this analysis focus principally on future quotas and implicitly assume that price support levels will remain relatively static. This is because growers have typically shown a preference to maintain price at higher levels and accept lower quotas when faced with pressure to accept either lower price support levels or lower quotas. This has not, however, always been the case, and the experience of the mid-1980s illustrates how growers have been willing to accept lower price supports in one instance. Indeed, many in the tobacco industry have suggested that the same could happen during the mid-1990s.

As a result, these alternative scenarios should be viewed as what *could* happen to future quotas given present circumstances. These scenarios should *not* be viewed as the definitive and inclusive range of all possible outcomes. Obviously, if the Chinese market suddenly opened in a significant way to non-Chinese cigarettes (currently the Chinese market is largely closed to U.S. cigarette imports) then quotas in ten years could be at least as high as they are today -- or even higher.[3] At the same time, if the Food and Drug Administration (FDA) takes action to significantly regulate cigarettes, then quotas could be substantially lower in ten years than those estimated in this analysis.[4] Likewise, other events could occur, like major changes in the tobacco program or price support level, that could significantly alter the course of events. Presumably though, the probability of some of these events occurring should be implicitly captured by the delphi approach. For example, an expert's forecast of

future cigarette exports would certainly reflect the anticipation of changes in the status of the Chinese market access to U.S. produced cigarettes.

Model Assumptions Used in Creating Alternative Scenarios

	Q1	Q2	Q3
• Excise tax	$.25	$.50	$.75
• Cons. impact (annual)	-5%	-11%	-15%
• U.S. smokers (agg.)	-2%	-3%	-4%
• U.S. smokers (per)	-2.1%	-3%	-4.8%
• Cigarette exports	3%	1.5%	1%
• Burley leaf	.75	.75	.67
• Cig. size	0%	0%	0%
• Extended uses	0	0	0

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The model assumptions with regard to parameter values are shown on this slide. Factors affecting the future of tobacco are listed on the left. The first, second, and third quartile values that were derived from the distributions produced by the expert questionnaire are listed across the rows, beginning with the "Q1," "Q2," and "Q3."

For example, according to the tobacco experts, the first quartile value for the proposed increase in the federal excise tax is $0.25. Meanwhile, the median or second quartile value is $0.50 and the third quartile is $0.75. The anticipated values associated with the expected decrease in consumption are -5%, -11% and -15%. Cigarette consumption is expected to decline at both an aggregate and per smoker level as evidenced by the range of values of -2% to -4% and -2.1% to -4.8% respectively. On the other hand, it is generally believed that cigarette exports will increase over the next ten years as demonstrated by the range of expected annual increases of 3% in the best probable scenario to 1% in the worst probable scenario. Currently, the amount of burley leaf in cigarettes is about .75 pounds (in Farm Sales Weight, FSW, per 1,000), and is generally expected to remain stable. However, some believe it will be lower and this is reflected in the .67 lbs. per 1,000 cigarettes in the worst probable case. The size of cigarettes has fallen steadily since the 1950s but further declines are not expected by the tobacco experts surveyed. Finally, while researchers are hopeful that extended uses for the tobacco plant (e.g., protein source or molecular genetic engineering) will increase the demand for tobacco, none of the tobacco experts expects that these uses offer the potential to significantly increase the burley quota within the next decade.

Model Assumptions, cont.

	Q1	Q2	Q3
• DCL	5 yrs	3 yrs	1 yr
• Leaf exports*	-1.5	-1%	2%
• Cigs moved 'off-shore'*	175	100	0
• 'Off-shore' (dom cont)	29%	25%	16%
• Long-term dom. cont.	53%	50%	40%

*Scenarios should be internally consistent.
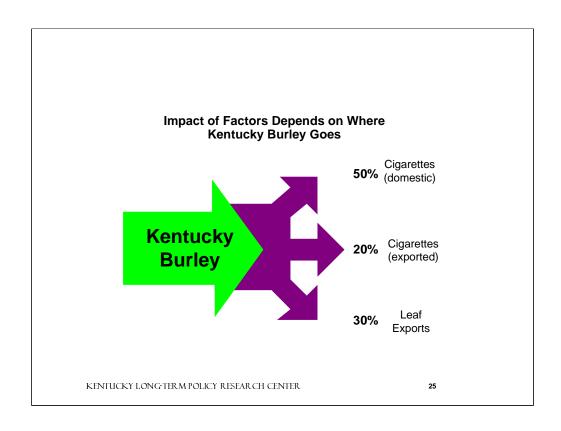
The model assumptions are continued on this chart. The vast majority (87%) of the tobacco experts indicated that domestic content legislation (DCL) would not survive the GATT review (refer to page 81). The real question centers on how long it will remain. The assumptions used in this analysis are 5 years, 3 years, and 1 year.

A majority of tobacco experts believe domestic content legislation will have a negative impact on leaf exports. This is because the world market will likely have an abundance of tobacco leaf due to cigarette manufacturers not buying as much on the international market as they would have without the domestic content legislation. Thus, to ensure that the scenarios are internally consistent and make substantive sense, it is assumed that leaf exports will *decline* by 1.5% annually in the "Q1" scenario while they will *increase* by 2% annually in the "Q3" scenario.
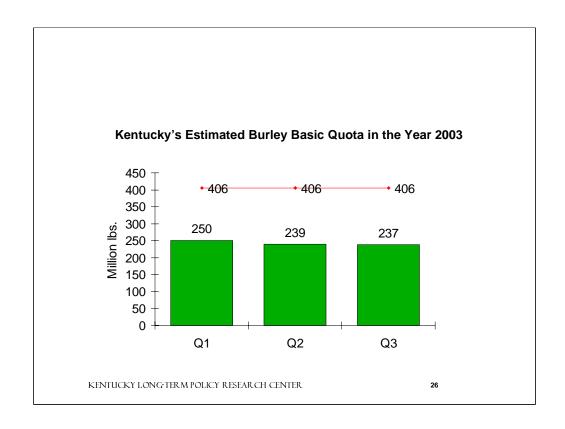
Similarly, most experts believe that cigarette manufacturers will "move" some production "off-shore" to escape the requirements of the legislation. This is because foreign leaf is typically cheaper than U.S. grown leaf. The real questions then become, "how much production will move off-shore?," and "how much U.S. grown leaf will be used in these cigarettes?" The assumptions used in the scenarios are shown above, with 175 billion units moved off-shore in "Q1," 100 billion in "Q2," and 0 in "Q3." Again, this ordering reflects the necessity of internal consistence and substantive sense -- with manufacturers moving more units off-shore the longer domestic content legislation remains in effect.

Finally, the domestic content of cigarettes manufactured in the U.S. was about 60% before the DCL was instituted. The tobacco experts were asked to estimate where this percentage might be in ten years without domestic content legislation. Their response is reflected in the last line, with 53% in "Q1," 50% in "Q2," and probable," and 40% in "Q3." Refer to Appendix D, "Model Assumptions and Questionnaire Results in Their Historical Context," to view the distributions that produced these values.

**Impact of Factors Depends on Where
Kentucky Burley Goes**

Kentucky Burley

50% Cigarettes (domestic)

20% Cigarettes (exported)

30% Leaf Exports

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The impact that each factor exercises on Kentucky's burley quota is largely dependent on where Kentucky's burley is going. For example, if most of Kentucky's burley was exported as unmanufactured leaf instead of being used for cigarette production for U.S. consumption, then the impact of the tax increase would be significantly different.
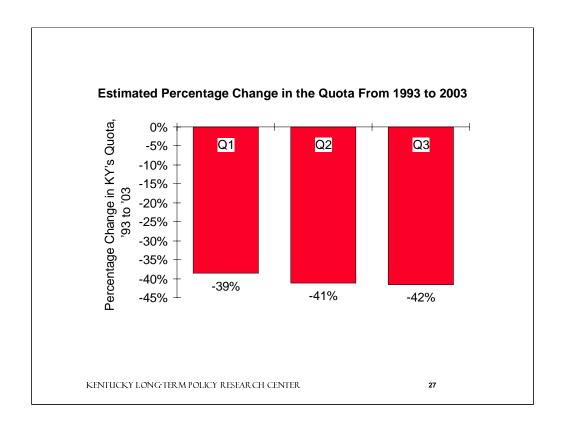
This chart shows the approximate distribution of Kentucky's burley. The exact distribution used in the model is 48% in domestic cigarettes, 19% in exported cigarettes, 29% in exported leaf, and 4% in other (see slide 73, "Distribution of Kentucky Burley: Model Assumptions).

Kentucky's Estimated Burley Basic Quota in the Year 2003
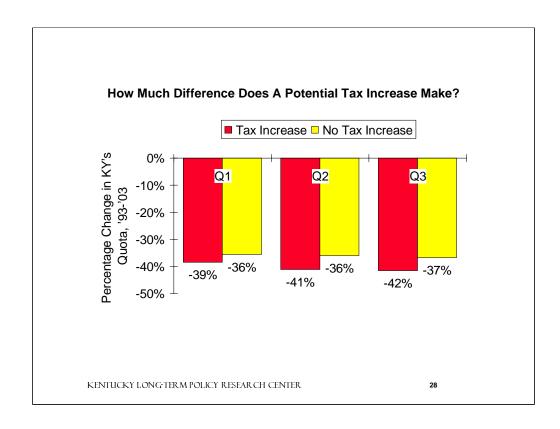
The three bars illustrate the resulting impact on Kentucky's burley basic quota if the tobacco experts' projections come to fruition. The line above the bar indicates the 1993 basic quota of 406 million pounds.

The "Q1" and "Q3" scenario outcomes are so similar because of the assumptions regarding the movement of cigarette manufacturing "off-shore" and the negative impact on leaf exports resulting from domestic content legislation. The 175 billion cigarettes expected to be "moved" to foreign locations (see page 24) in the "Q1" scenario and the significantly less U.S. grown leaf used to manufacture them has a tremendous negative impact on future burley quotas. In contrast, no cigarette production was moved or shifted to foreign locations in the "Q3" scenario.

As one can see, there is a remarkable convergence around the 240 million pound level, but what does this reflect on a percentage basis?

Estimated Percentage Change in the Quota From 1993 to 2003

The percentage change from 1993 to 2003 are reflected on this slide. As one can see, these basic quota levels converge at around a 40% decline in Kentucky's basic burley quota. It should be noted that Kentucky's basic burley quota could drop by up to 30% within the next few years -- but it could then rise once the pool levels are brought down. The purpose of this analysis is to anticipate the long-term structural factors affecting future burley quotas -- not the short-term oscillations.

How Much Difference Does A Potential Tax Increase Make?

Kentucky Long-Term Policy Research Center   28

The proposed federal excise tax increase on a pack of cigarettes has received the bulk of media attention with regard to the future of burley tobacco. However, this analysis shows that even without a tax increase future burley quotas are likely to experience a significant decline.

The assumptions in the "Q1," "Q2," and "Q3" scenarios are that there will be 5%, 11%, and 15% declines in cigarette consumption resulting from a proposed tax increase (these numbers reflect the quartile values derived from the tobacco experts' responses). Moreover, the assumption used in the model is that this percentage change will occur *in each of the next 10 years -- not just in the first year.* This assumption is consistent with recently published empirical literature on the long-term impact of price increases.[5]

Typically the focus is on the first-year impact on consumption. Some feel that after the first year of a price increase the consumer will adjust to it or that incomes will rise and consumption will return to where it would have been without a price increase. Others feel that the magnitude of tax increase being discussed will disproportionately affect young smokers (who have less disposable income and represent the biggest pool of new smokers) and permanently depress the number of smokers. Moreover, some have even suggested that the negative impact could be even greater in the future years. In this case it is assumed that the lost revenue resulting from less consumption will give rise to even higher taxes, which, in turn, will likely result in less consumption (and ultimately less revenue).

As a result, it was decided to strike a middle ground and assume that any reduction in consumption associated with a tax increase would be felt with the same magnitude for each of the years from 1993 to 2003.

Outline

- **Rationale**
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Some illustrative economic and social implications resulting from a 41% decline in Kentucky's burley quota are discussed in this section.

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Tobacco's Economic
Importance to Kentucky

- **Responsible for $518 million in state personal income in 1992**
  - – **0.9 percent of the total**
- **Accounts for 78,000 full- and part-time jobs**
  - – **5 percent of the total**
- **Relatively small amount of income at risk**
  - – **but a disproportionate impact on low-wage jobs**

Source: *Office of Financial Management and Economic Analysis, Finance and Administration Cabinet*

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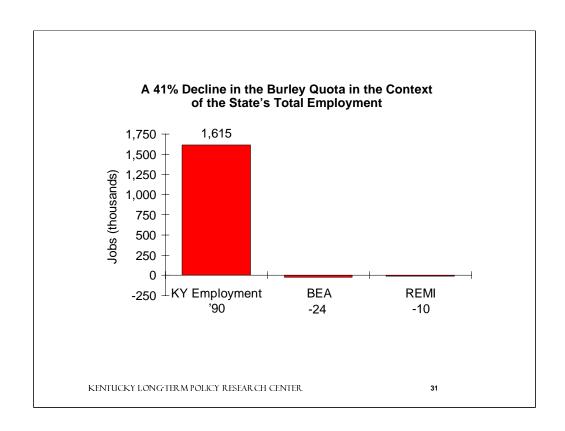
In order to address the issue of the economic and social implications resulting from a 41% decline in Kentucky's burley quota, it is necessary to understand tobacco's economic importance to Kentucky.

The Office of Financial Management and Economic Analysis conducted an analysis using 1992 data to determine the impact at the farm level. This analysis did not include an examination of the impact of tobacco manufacturing (i.e., cigarette manufacturing).

It was found that tobacco was responsible for $518 million in state personal income, which was almost 1 percent of the state's total personal income. Also, tobacco accounts for 78,000 full- and part-time jobs, which is around 5 percent of the total number of jobs in Kentucky.

A study done by Price Waterhouse in 1992 for the Tobacco Institute found that 137,000 jobs related to tobacco in 1990 (both on and off the farm) accounted for $2.1 billion in wages and benefits in Kentucky.

A 41% Decline in the Burley Quota in the Context of the State's Total Employment

This chart places a 41% decline in Kentucky's basic burley quota into the context of the state's total employment. It juxtaposes Kentucky's total employment (1990) to the associated job losses if a $300 million decline in value of Kentucky tobacco crop occurs.[6] The $300 million drop is derived by taking the dollar value of tobacco at 406 million pounds ($1.80 per pound) and at 240 million pounds ($1.80 per pound).[7] Given these assumptions, the value of the tobacco crop would be $731 million (or $0.731 billion) in the first example and $432 in the second instance.

Kentucky's total employment in 1990 was about 1.6 million (or 1,600 thousand). Using the regional input-output multipliers for Kentucky that the Bureau of Economic Analysis (BEA) has developed, a $300 million drop in tobacco output would translate into a loss of 24,300 jobs. Alternatively, the REMI model estimates the employment effects associated with a $300 million decline at about 10,000 jobs lost (see Appendix F, "REMI Analysis of Reduction in Tobacco Quota").

In both cases, it is apparent that this is a relatively small number in the wider context of the state's total employment. This would seem to bear out the contention made by USDA analysts. This analysis was centered on the economic impact associated with a 30 percent decline in tobacco production. They found that, in general, "as a share of total economic activity, the impacts are relatively small."[8] (However, they also noted that a 30 percent decline in tobacco production would be quite painful in localized areas -- especially in several Kentucky counties.)

31

The value of a farm in Kentucky is obviously dependent upon the perceived value of the land. Given that tobacco quotas are tied to a farm it is likely that the value of a farm will decline as the value of tobacco quotas decline. However, land values can be influenced in two offsetting ways. If less quota is available, then the land is probably worth less in the eyes of a potential purchaser. On the other hand, if the supply of quota is reduced, then any remaining quota becomes more valuable -- thereby increasing the value of land with quota. Nevertheless, most seem to believe that land values will be driven down as the value of tobacco (i.e., less quota) declines.

Source: William M. Snell and Steven G. Isaacs, *Examining the Economic Impact of Higher Excise Taxes on the U.S./Kentucky Burley Tobacco Industry*, University of Kentucky, College of Agriculture, February 1994.

What About the Impact at the County Level?

- **Which counties are the most "tobacco dependent"?**
  - tobacco income as a percentage of total county income
    - » **0 to 2.5% = low**
    - » **2.5% to 5% = med**
    - » **over 5% = high**
- **Which counties are already in "distress"?**
  - county poverty rate
    - » **0 to 15% = low**
    - » **15% to 25% = med**
    - » **over 25% = high**
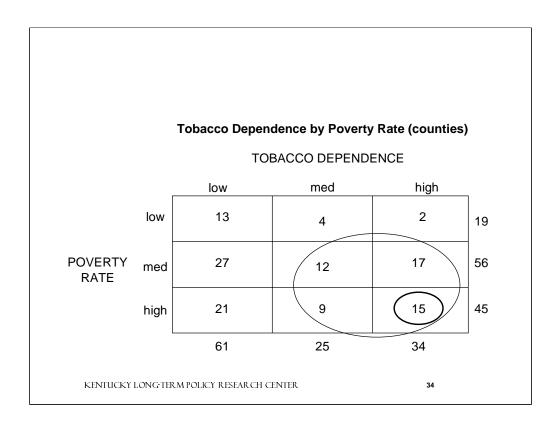
KENTUCKY LONG-TERM POLICY RESEARCH CENTER   **33**

We have thus far focused our attention on the impact of a declining burley quota at the state level. This comparison has suggested that at a *state* level the economic impact of a 41% decline in the tobacco quota would be relatively small as a share of the state's total employment and income.

To be certain, however, certain communities would be particularly hard hit by a declining quota. This slide explains the method for identifying the counties that would be especially hard hit by a significantly lower burley quota. There are two relevant questions. First, which counties are the most "tobacco dependent?," and second, "which counties are already in 'distress'?"

"Tobacco dependence" is defined as the county's tobacco income as a percentage of the county's total income. If this percentage is over 5%, then it is defined as high.[9] If this percentage is from 0% to 2.5% then the county's tobacco dependence is assumed to be low. Finally, a value between 2.5% and 5% places the county in the medium category. We are not including indirect effects in this definition, but it does not matter for the purposes of this comparison. This is because our focus is the *relative* dependence, not the *absolute* dependence.

Similarly, an attempt was made to identify those counties already in distress. The county poverty rate was used as a proxy to determine whether a county is in "distress." The poverty rate for the entire state is about 22%. Over 25% would place a county in the high category, between 15% and 25% in the medium group, and less than 15% in the low category.

Tobacco Dependence by Poverty Rate (counties)

TOBACCO DEPENDENCE

	low	med	high	
low	13	4	2	19
POVERTY RATE med	27	12	17	56
high	21	9	15	45
	61	25	34	

These two dimensions are combined into a single matrix to identify those counties that have the highest tobacco dependence and highest poverty rate. This matrix reveals 15 counties that rank "high" on both dimensions. There are yet another 38 counties that rank at least "medium" on both dimensions. This would indicate that a total of 53 counties are at least medium on both dimensions. (Refer to Appendix C for a listing of each county's poverty rate and tobacco's portion of county income.)

Fifteen Counties at Risk from a Significant Quota Decline

County	Tobacco's Estimated Portion of Total Personal Income (percent)	Poverty Rate (percent)
State (median)	2.2	21.1
Bath	9.9	27.3
Casey	7	29.4
Clinton	4.9	38.1
Cumberland	6.5	31.6
Elliott	7.1	38
Fleming	9.2	25.4
Hart	9.3	27.1
Jackson	5.3	38.2
Lewis	5.9	30.7
Lincoln	5.5	27.2
Menifee	6.1	35
Metcalfe	10	27.9
Morgan	6.1	38.8
Owsley	7.5	52.1
Wolfe	6.1	44.3

This chart lists the fifteen counties that are at greatest risk from a significant decline in the burley quota. These 15 counties are located in eight different Area Development Districts (ADD) (Buffalo Trace, FIVCO, Gateway, KY River, Cumberland Valley, Bluegrass, Lake Cumberland, and Barren River). In order to place these percentages into a wider context, it is important to note that at the state level (analyzing all 120 counties), the median value for tobacco dependence is 2.2% and the median value for the poverty rate is 21.1%.

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Fifteen Counties at Risk from a
Significant Quota Decline

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This map illustrates the fifteen "at risk" counties. These counties are located in quite diverse areas of the state. Consequently, there is no magic bullet in terms of a solution for the lost tobacco income that these counties are likely to face. They have distinct strengths and weaknesses. For example, Hart County is already agriculturally diverse with significant production in alfalfa hay, corn, wheat and soybeans. Elliott County, on the other hand, has different opportunities and constraints available to it.

The differing strengths and weaknesses of these counties necessitate unique solutions, and this suggests that the local citizenry must play an active role in determining the future course of these communities.

Outline

- **Rationale**
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- **Alternative scenarios**
- **Economic and social implications**
→ • **Policy recommendations**

KENTUCKY LONG-TERM POLICY RESEARCH CENTER 37

Policy recommendations are offered in this section. It is important to note that these recommendations are designed to simultaneously achieve two objectives:

(1) facilitate a best case scenario by attempting to keep the burley quota as high as possible; and

(2) hedge against a worst case scenario by taking actions to cushion the impact of a declining quota for those most affected.

What then, can policymakers do to facilitate a best case scenario?

Before answering this question, it is necessary to:

(1) identify those factors exercising the greatest <u>impact</u> on burley quotas;

(2) identify those factors that offer the most <u>leverage</u> to policymakers to affect;

(3) isolate those factors that have the greatest impact and offer the most leverage to policymakers; and

(4) formulate policies that address these important elements.

Sensitivity Analysis Helps Identify Factors with Impact

Percentage Change in Quota, '93 to '03

Sensitivity analysis is used to identify those factors having the greatest impact on the burley quota. This is done by setting the quantitative model (see Appendix E) to its base line values, and then changing each parameter -- one at a time -- to the median value derived from the expert responses, gauging the impact on the burley quota.
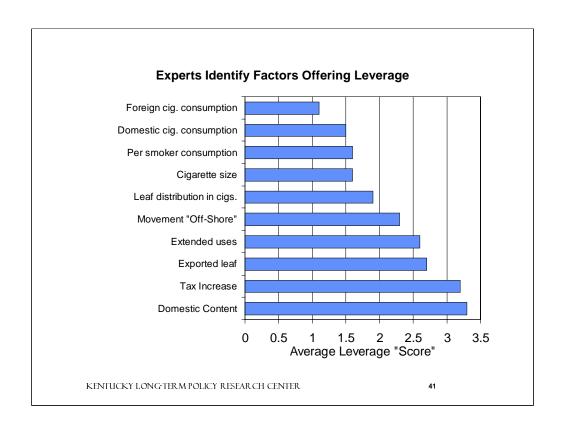
For example, no changes are expected in cigarette size, extended uses for tobacco, or the amount of burley leaf used per 1,000 cigarettes. As expected then, the sensitivity analysis would register no impact on the burley quota. These three factors are appropriately listed at the bottom of the ranking on the chart and are considered to be in the "low" impact category.

The expert consensus regarding the annual rate of change over the next ten years for unmanufactured leaf exports is -1% (the median value). If all other factors are held constant at their base line value, then the burley quota would decrease by -2.8% -- as reflected in the chart above. Rounding out the remaining four factors in the "medium" grouping are the expected annual rate of change in foreign cigarette consumption (1.5% annual change resulting in a 3.1% increase in the quota), a tax increase of $0.50 (resulting in a 11% decline in domestic cigarette consumption and a commensurate 7.9% decline of the burley quota), domestic content in cigarettes that moves incrementally downward to 50% (with a -8.6% impact on the quota), and the movement of 100 billion cigarettes "off-shore" (-9.1% quota decline).

There are two factors in the "high" impact category. They are the anticipated annual decline of 3% in both aggregate and per smoker cigarette consumption. Both of these factors result in a 12.6% decrease in the burley quota.

The sensitivity analysis suggests that policymakers attempting to keep the quota as high as possible ought to focus their attention on those factors at the top of the chart. However, this is not the complete story because not all factors offer the same

degree of leverage to policymakers. Therefore, it is important to also consider where the greatest leverage is to be found.

Experts Identify Factors Offering Leverage

Factor	Average Leverage "Score"
Foreign cig. consumption	1.1
Domestic cig. consumption	1.5
Per smoker consumption	1.6
Cigarette size	1.6
Leaf distribution in cigs.	1.9
Movement "Off-Shore"	2.3
Extended uses	2.6
Exported leaf	2.7
Tax Increase	3.2
Domestic Content	3.3

Average Leverage "Score"

The questionnaire was used to ascertain where the leverage exists for policymakers to affect the factors exercising influence over the future burley quotas. The tobacco experts were asked to gauge on a scale that ranged from 0 to 5 the amount of leverage available for policymakers (where 0 indicates no leverage and 5 indicates very high leverage).

The specific question reads: "Several potentially important elements of change that could affect the future of burley tobacco are listed below. How much influence or leverage do you think Kentucky's federal and state level policymakers can exercise on these factors? Use the scale below to indicate the degree to which you believe policymakers can affect the course of these factors" (see Appendix A, question 26.).

There are five factors that are arguably in the "low" leverage category. The experts gave foreign cigarette consumption the lowest average score at 1.1, while both aggregate and per smoker domestic cigarette consumption had average scores of 1.5 and 1.6 respectively. Similarly, the expert consensus is that there is little leverage to be had over cigarette size, demonstrated by an average of 1.6, or leaf distribution, which has an average leverage score of 1.9.
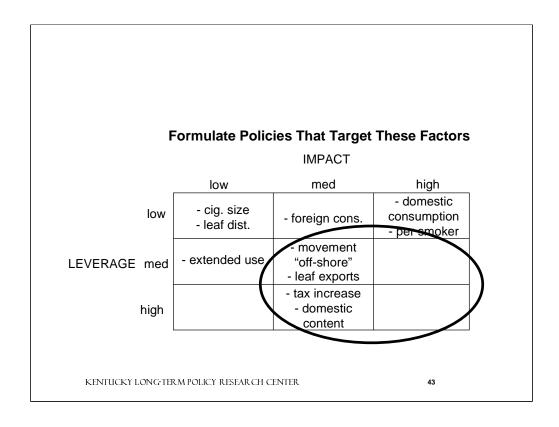
There are three factors in the "medium" leverage range, with the movement of cigarette production "off-shore" showing an average score of 2.3, developing extended uses for tobacco at 2.6, and facilitating leaf exports at 2.7.

Finally, there are two factors in the "high" leverage category. The two factors believed to offer the most leverage to policymakers are the proposed tax increase at 3.2 and the level of domestic content at 3.3.

(Refer to Appendix B, questions 26a. to 26l., for the summary statistics derived from the expert consensus on each factor).

41

Isolate Factors With Impact and Leverage

IMPACT

	low	med	high
low	- cig. size - leaf dist.	- foreign cons.	- domestic consumption - per smoker
LEVERAGE med	- extended use	- movement "off-shore" - leaf exports	
high		- tax increase - domestic content	

The two dimensions of leverage and impact are combined to produce the matrix illustrated on this slide. It shows, for example, that there are no factors that offer both "high" impact and leverage, although there are several factors that demonstrate at least "medium" impact and leverage.

Formulate Policies That Target These Factors

IMPACT

LEVERAGE		low	med	high
	low	- cig. size - leaf dist.	- foreign cons.	- domestic consumption - per smoker
	med	- extended use	- movement "off-shore" - leaf exports	
	high		- tax increase - domestic content	

Clearly then, the formulation of policies designed to keep the burley quota as high as possible ought to be focused on those factors offering the most leverage and impact. *This is not to suggest that policymakers ignore other factors that can also make a difference.* For example, the expert consensus is that policymakers can exercise a relatively high degree of leverage over the extended uses for tobacco. At the same time, however, virtually none of the experts surveyed felt that this factor would have a significant impact on the burley quota over the next 10 years.

Consequently, we focus our attention on those factors that can make a difference on future quotas and over which policymakers can exercise some control. The four factors identified by this analysis as deserving the most attention by policymakers are:

- the movement of cigarette manufacturing "off-shore";
- the export of unmanufactured leaf;
- the tax increase; and,
- domestic content.

• Work to enact legislation to have domestic content labelled on a package of cigarettes. Approximately 50 percent of Kentucky's burley is used in the production of cigarettes that are consumed in the United States. It is no surprise, then, that the level of domestic content in cigarettes exercises substantial influence over Kentucky's burley quota. However, the domestic content legislation that took effect in January 1994, which is designed to increase the level of U.S. grown tobacco leaf in cigarettes, will likely be ruled inconsistent with the free trade provisions of the General Agreement on Tariffs and Trade (GATT). Pressure will then mount on the United States to abolish this legislation. While some elements of this legislation might legally remain intact under Article 28 of GATT, many believe that this legislation is accelerating the movement of cigarette production "off-shore." One consequence of a "shift" from the United States to foreign locations is the likelihood that significantly less domestically grown tobacco will be used in cigarette production. The same desired end (i.e., increasing domestic content) can be achieved through market forces if burley groups can capitalize on their comparative advantage of higher quality leaf, but this can only be done if domestic content is labelled on a pack of cigarettes.

• *Create a consortium of tobacco producing states to market leaf exports.* About 30 percent of Kentucky's burley is exported as unmanufactured leaf. As a result, the level of leaf exports exerts a major influence over Kentucky's burley quota. Until a few years ago, the federal government provided this service under the Market Promotion Program. The tobacco producing states should fund market promotion programs to achieve this purpose. Also, Kentucky should consider a Farm Bureau recommendation to provide funding for an economist "to study and determine potential foreign market areas for Kentucky grown tobacco" (Kentucky Farm Bureau Policies, 1994).

• *Fund research and development that is focused on extended uses for the tobacco plant.* The tobacco plant holds tremendous potential as a source of high grade protein and as a tool for molecular biologists in bioengineering. While few believe that these extended uses will mature sufficiently over the next decade to significantly help tobacco farmers (see Appendix G), there appears to be enough promise in these areas to warrant future research and development. Policymakers should encourage this type of research at the state's universities by ensuring that funding is channelled in the necessary directions.
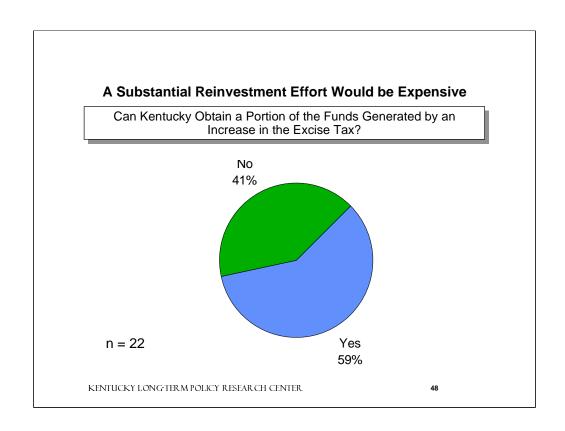
At the same time policymakers are trying to facilitate a best case scenario, they should also work to hedge against a worst case scenario. Toward that end, the following recommendations are offered:

• *Facilitate farm diversification.* There is no single crop that can replace lost tobacco income. There are, nevertheless, opportunities available to farmers wishing to diversify and policymakers should facilitate this diversification. For example, conventional crops and livestock can be used to partially offset lost tobacco income. Moreover, supplemental crops and animal products, including, but not limited to, fruits, vegetables, aquaculture and specialty products can be pursued. A fundamental obstacle to farm diversification is a suitable infrastructure necessary for transporting, storing, and selling fruits and vegetables. Policymakers can help facilitate farm diversification by targeting rural development funds toward several different infrastructure investments. Some basic examples include coolers, storage facilities, and trucks to haul produce to markets. A specific example would include the proposed farmers' market in Northern Kentucky. By ensuring that such projects reach fruition, the state can play a positive role in facilitating farm diversification.[10]

• *Develop a framework to increase local purchases.* Over 70 percent of the food consumed in Kentucky is brought in from outside the state.[11] A significant marketing effort would be required, but Kentucky's farmers can help satisfy some of this consumer demand if the proper framework is developed. Policymakers can help develop a framework to increase local purchases by facilitating farm diversification and funding programs like farmers' markets and fruit/vegetable cooperatives. Moreover, the state can also engage in a "Buy Kentucky" campaign to publicize the benefits of increasing local purchases. Some of the ancillary benefits would include increased agricultural sustainability, higher "vegetable income" for Kentucky's farmers, fresher products for Kentucky's consumers, and ultimately a strengthening of Kentucky's rural economies.

• *Work to develop farm commodity exports*. In 1992 Kentucky exported $879 million in agricultural products, which is equivalent to 27% of the state's agricultural production.[12] Unfortunately, while U.S. exports increased by 12% from 1991 to 1992, Kentucky's exports remained static.[13] The largest increases on a national level were seen in wheat, soybeans, and live animals. Kentucky has considerable opportunity for increased production in each of these areas.[14] Accordingly, Kentucky's policymakers should ensure that Kentucky's agricultural strategic development plan, *Ag. Project 2000: A Comprehensive Master Plan for Kentucky Agricultural Economic Development*, receives adequate attention and support.

• *Focus attention on those communities especially vulnerable to a significant decline in the burley quota*. Some geographic areas of the Commonwealth will suffer severe economic distress as a result of a significant long-term decline in the burley quota. State government should recognize that these communities are in need of special assistance and extraordinary consideration. There are many state government programs designed to create new jobs, to retain and upgrade existing industries, to provide for the deployment of new technologies for the purpose of enhancing workers' performance and competitiveness, and to reverse trends of prolonged periods of area dilapidation and economic decay. Policymakers should ensure that any programs designed to accomplish economic revitalization can be applied to the communities identified in this report as particularly vulnerable to a significant decline in the burley quota.

A Substantial Reinvestment Effort Would be Expensive

Can Kentucky Obtain a Portion of the Funds Generated by an Increase in the Excise Tax?

No
41%

Yes
59%

n = 22

A substantial reinvestment effort centered on this type of infrastructure development would be quite expensive. Where then, given the state's budget situation, would Kentucky obtain funding for these projects? One will remember figure 10 which showed that 96% of the surveyed experts felt that a tax increase would take place. Given this, a follow-up question was asked, "If the federal excise tax on cigarettes is increased, do you think the tobacco states can obtain a portion of this money to help cushion the blow of declining quotas?" (see Appendix A, question 20).

A majority of the experts felt that the tobacco states would be able to obtain a portion of this funding, as evidenced by the chart.

How Much Money *Might* Be Available and Needed?

- **Expert questionnaire used to answer these important questions**
  - **how much money *might* be available?**
    - » **cigarette consumption**
    - » **amount of tax increase**
    - » **percent of $'s back to tobacco states**
    - » **percent of $'s to Kentucky**
  - **how much money *might* be needed?**
    - » **types of reinvestment projects**
    - » **amount of quota sold back to government**
    - » **price paid per pound**
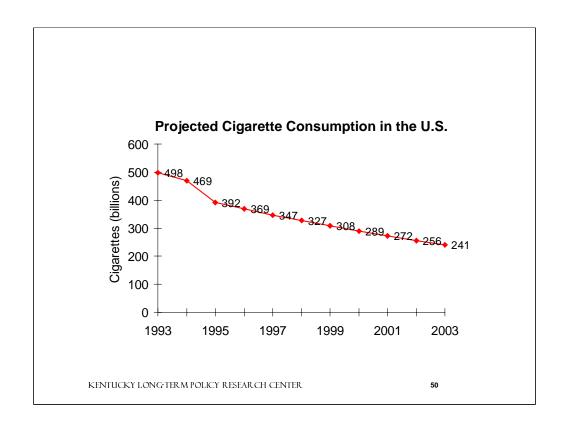
How much money *might* be available and needed for such an investment effort? The expert questionnaire was used to answer these important questions.

First, how much money might be available? This is a highly speculative question. Even though a majority of experts feel it likely, there is no guarantee that the tobacco states can obtain some of the tax money in the form of a rebate. Moreover, even if Kentucky can get some of this money, it is unclear as to how long a "tobacco rebate" would last. It could last for ten years, or it might only last for a few years. Nevertheless, we offer the following scenario.

The amount of money available is essentially dependent upon the number of cigarettes consumed, the amount of the tax increase, the percentage going to tobacco states, and the percentage coming back specifically to Kentucky.

The amount of money needed is wholly dependent upon the types of reinvestment projects, whether any quota is retired by selling it back to the government, and the price at which quota holders would be willing to sell their quotas.[15]

The parameter values derived from the expert questionnaire and the quantitative model used to generate their impact on future burley quotas are used to answer these questions.

Projected Cigarette Consumption in the U.S.

This chart illustrates projected cigarette consumption in the United States under the "Q2" scenario. The assumptions that generate this forecast are based on the expert consensus on the impact of a tax increase (-11%), expectations of the annual rate of change in domestic cigarette consumption (-3%), and the anticipated annual rate of change in the per smoker cigarette consumption (-3%). Each of these values represents the median value for the respective distribution.

(Refer to Appendix E, cells C25:M25, for an examination of the model output.)

Other Assumptions
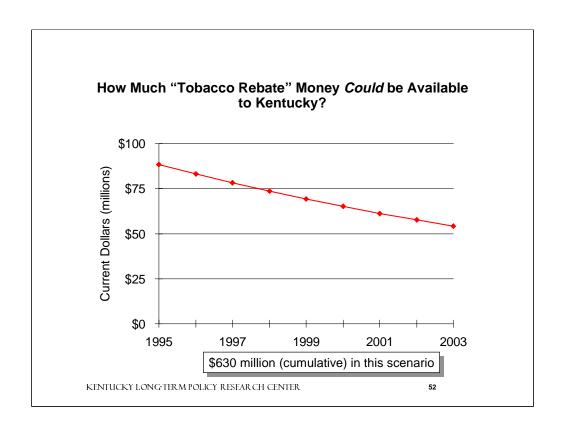
- **Tax increase**
  - **a $0.50 increase**
- **Percentage returned to tobacco states**
  - **a 3% return**
- **Kentucky's portion**
  - **a 30% return**
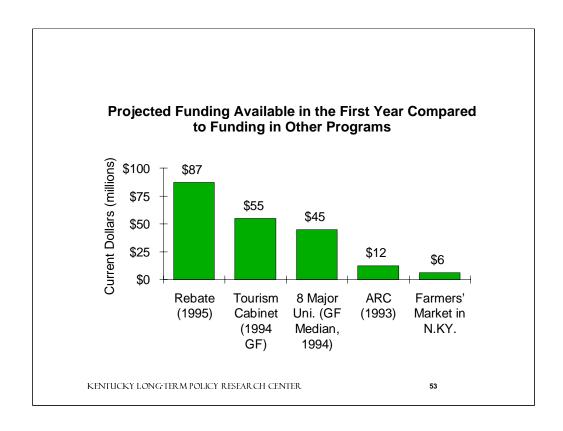
Each of the following assumptions is derived from the expert questionnaire and represents the 50th percentile or median value of the responses:

• a $0.50 tax increase;

• 3% returned to the tobacco states; and

• Kentucky's portion is 30%.

How Much "Tobacco Rebate" Money *Could* be Available to Kentucky?

$630 million (cumulative) in this scenario

Given the assumptions delineated on the previous two slides, a possible scenario is illustrated on this chart. The cumulative amount is nearly $630 million. However, to reiterate, this assumes a highly uncertain length of time (9 years) and no one knows how long a potential rebate would last.

Projected Funding Available in the First Year Compared to Funding in Other Programs

Current Dollars (millions)

Program	Amount
Rebate (1995)	$87
Tourism Cabinet (1994 GF)	$55
8 Major Uni. (GF Median, 1994)	$45
ARC (1993)	$12
Farmers' Market in N.KY.	$6

Even if the tobacco rebate program lasted for only a short while, it is still a significant amount of money. This chart illustrates a conservative level of funding under a rebate program. In the first year alone, $87 million could be received. This is more than the 1994 general fund appropriation for the state government's Tourism Cabinet ($55 million),[16] the median level of general fund appropriation for the state's eight major universities ($45 million),[17] the amount of money allocated by the Appalachian Regional Commission to Kentucky in 1993 ($12 million),[18] and the total funding proposed for a farmers' market in Northern Kentucky ($6 million).[19]

Major Conclusions

- **Burley tobacco quota is likely to fall around 40% over the next ten years**
- **Quota is going down -- regardless of the outcome on the tax**
- **Impact will be felt unevenly across the state**
  - **certain communities will be especially hard hit**
- **Policymakers can exercise some leverage**
  - **replace domestic content legislation with domestic content labelling**
  - **facilitate leaf exports**
  - **R&D dollars for extended uses**

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While there are many possible outcomes over the next decade for Kentucky's burley quota, this analysis suggests that significant structural factors will likely depress Kentucky's basic burley tobacco quota by around 40 percent over the next ten years. Moreover, a decline of this magnitude is likely to occur even *without* a significant increase in the federal excise tax on a pack of cigarettes -- i.e., the quota is going down regardless of how the tax situation turns out. The economic and social impact will be felt unevenly across Kentucky, with certain "tobacco dependent" communities especially hard hit. Nevertheless, Kentucky's policymakers can mitigate the potentially deleterious consequences of a declining burley tobacco quota.

Policymakers can work toward achieving a best case scenario by: 1) replacing domestic content legislation with domestic content labelling; 2) facilitating leaf exports; and 3) providing funding for research and development into extended uses for tobacco.

Major Conclusions

- **Over 95% of the surveyed experts feel that there will be an increase in the federal excise tax on cigarettes**
  - most experts think that the tobacco producing states can obtain a percentage back for reinvestment
  - it is *potentially* a lot of money
- **This money can be used for multiple purposes**
  - there are many programs that could cushion the blow of declining quotas for Kentucky's communities
    - » community, economic, agricultural, and/or rural development programs

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Over 95% of the surveyed tobacco experts feel that there will be an increase in the federal excise tax on cigarettes, but a majority also feels that the tobacco states can receive some of this money back in the form of a "tobacco rebate."

This is potentially a lot of money and can be used for multiple purposes. There are several community development programs that could help achieve farm diversity and local purchases. Many of these programs could help cushion the blow of declining quotas for Kentucky's tobacco communities.

ENDNOTES

[1]"Face Reality on Tobacco," *Lexington Herald-Leader*, May 15, 1994, p. E1.

[2]The sensitivity analysis is conducted by changing one parameter value at a time from the base line value to the median value. This allows us to gauge each parameter's impact on future burley quotas. Thus, the definition of "likely change" in this analysis is from the current value to the median value (derived by the expert response distribution for each factor).

[3]See "The Tobacco Trade: The Search for El Dorado," *The Economist*, May 16, 1992, vol. 323, no. 7759, p. 21, and Damon Darlin, "Pipe Dreams," *Forbes*, April 26, 1993, vol. 151, no. 9, p. 45.

[4]Maggie Mahar, "Tobacco's Smoking Gun," *Barron's*, May 16, 1994, pp. 33-37.

[5]See for example, Gary S. Becker, Michael Grossman, and Kevin M. Murphy, "An Empirical Analysis of Cigarette Addiction," *The American Economic Review* (June, 1994). They estimated the short-run price-elasticity to be -0.4 and the long-run price-elasticity to be -0.75. Our forecast of cigarette consumption in Year 1 of the tax incorporates a short-run elasticity of roughly -0.4. This means that a new graph of future cigarette consumption (with t_1 = first year of the tax) has an intercept closer to the origin. Assuming that cigarette consumption decreases in the future, the question arises as to how quickly the negative slope of the new consumption line increases during the next 10 years, since $|\delta \text{elasticity}/\delta t| > 0$ as $t \rightarrow \infty$. We ultimately decided that the period we are looking at is too short to justify much movement toward the asymptotic effect of a tax increase. Furthermore, a separate study of cigarette consumption, reported in *The Journal of Political Economy,* found a short-run price elasticity of -0.2 and a long-run price elasticity of -0.45. Therefore, projections for the next ten years assuming a price-elasticity of demand of around -0.4 for the entire period seem quite reasonable.

[6]The $300 million decline reflects the difference between a 406 million pound quota at $1.80 per pound, which would have a value of $731 million, and a 240 million pound quota at the same price per pound, which would be worth approximately $300 million less, at $432 million.

[7]Tobacco income in this case is narrowly defined solely as the value of the tobacco crop. It is calculated by multiplying the basic quota (pounds) by the average value per pound ($1.80). This approach is consistent with other work done in this area. See, for instance, Snell and Isaacs, Feb. 1994.

[8]Refer to "Tobacco Economies: What's Ahead?," *Agricultural Outook*, September 1993.

[9]This 5% threshold is consistent with work done by the United States Department of Agriculture on the economic impact of a declining tobacco quota. See "Tobacco Economies: What's Ahead," *Agricultural Outlook,* Economic Research Service, United States Department of Agriculture, September 1993, pp. 27-31.

[10]Refer to *Investing in the Farms and Communities of America's Tobacco Regions,* Community Farm Alliance, November 1993 draft.

[11]Interview with Commissioner of Agriculture, Ed Logsdon, September 1993.

[12]William Sprague, President, Kentucky Farm Bureau Federation, "Trends in Agriculture," May 1994, unpublished paper.

[13]Ibid.

[14]Ibid.

[15]Jasper Womach, "Economic Assistance for Tobacco Production regions to Offset Losses from Higher Cigarette Taxes?," Congressional Research Service, Memorandum, March 22, 1994.

[16]*Budget of the Commonwealth, 1992-1994.*

[17]*Budget of the Commonwealth, 1992-1994.* The median level of general fund appropriation for the state's eight major universities is calculated as: KSU $18.6 million; NKU $29.6 million; Morehead $32.4 million; Murray $38.6 million; WKU $51.1 million; EKU $53.7 million; UL $137.5 million; and UK $246.6 million.

[18]The total is $12,481,000 (provided by Tom Craighead, Department of Local Government).

[19]The state's portion is $3 million while matching federal funds account for the other $3 million.

[20]A USDA analysis assumes that the manufacturers will move production "off-shore." See "Domestic Marketing Assessment for Domestic Cigarette Manufacturers," Tobacco and Peanut Analysis Division, USDA-ASCS, December 1, 1993. Some of the manufacturers, however, dispute this assumption. Refer to Mike Brown, "Law to Hurt -- not Help -- U.S. Tobacco, Study Says," *Courier-Journal*, January 1, 1994, p. A1.

APPENDIX A
TOBACCO QUESTIONNAIRE: ELEMENTS OF POTENTIAL CHANGE

Cigarette Tax
1. Do you think there will be an increase in the federal excise tax on a pack of cigarettes? ____
2. If yes, how much do you think this increase will be? ____
3. What percentage decrease in cigarette consumption do you anticipate as a result of this tax increase? ____

Burley Leaf in Cigarettes
4. Total burley currently accounts for about 0.75 pounds (or about 38.5%) of the total tobacco leaf (FSW) used per 1,000 cigarettes manufactured. Do you think the amount of burley used per 1,000 cigarettes will be different 10 years from now? ____
5. If yes, how much burley do you think will be used per 1,000 cigarettes? ____

Domestic Cigarette Usage
6. What do you think the average annual rate of change in total domestic cigarette consumption will be over the next 10 years (percent)? ____
7. In the U.S., the average smoker consumes about 7,500 cigarettes annually. What do you think the average annual rate of change will be over the next 10 years (percent)? ____

Foreign Cigarette Usage
8. What do you think the average annual rate of change in foreign cigarette consumption will be over the next 10 years (percent)? ____

Exported Unmanufactured Leaf
9. What do you think the average annual rate of change in exported unmanufactured leaf will be over the next 10 years (percent)? ____

Domestic Content
10. In light of the General Agreement on Tariffs and Trade (GATT), do you think that the current domestic content legislation (75%) will remain intact? ____
11. What do you believe the percentage of domestic content in cigarettes would be in ten years if there was not a domestic content requirement? ____
12. Do you think that the cigarette manufactures will move production overseas to escape the requirements of the legislation? ____
13. If yes:
    a. How much production do you think will be moved outside the U.S. over the next 10 years (in terms of numbers of cigarettes)? ____
    b. Compared to the amount of U.S. leaf that is used currently in the production of these cigarettes (about 60%), how much U.S. leaf will be used if production is moved overseas (percent)? ____
14. What impact, if any, will the domestic content requirement have on the total amount of burley used per 1,000 cigarettes? ____
15. What impact, if any, will the domestic content requirement have on the *total* amount of leaf used per 1,000 cigarettes? ____
16. What impact, if any, will the domestic content requirement have on U.S. exports of unmanufactured leaf? ____

Extended Uses for Tobacco
17. Do you think that some of the extended uses proposed for tobacco (e.g., plant bioengineering) will significantly increase the demand for tobacco over the next 10 years? ____
18. How much additional demand do you think will be generated as a result of extended uses for tobacco (pounds)? ____
19. How much of this additional demand do you think Kentucky's tobacco growers will help satisfy (percent)? ____

Cushioning the Impact of Lost Quota for Tobacco Farmers
20. If the federal excise tax on cigarettes is increased, do you think the tobacco states can obtain a portion of this money to help cushion the blow of declining quotas? ____
21. If yes, what percentage do you think will come back to *all* tobacco states? ____
22. Of this total amount, what percentage do you think Kentucky can hope to obtain? ____

23. Some have suggested that quotas be purchased from farmers to ease the impact of declining quotas.   At what price per pound do you think quota holders would be willing to sell their quotas? ____

Other

24. Periodically bills are introduced in the U.S. Congress that are designed to eliminate the tobacco price support program. Using the scale below, how probable do you believe it is that the tobacco price support program will be **abolished** within the next 10 years?

Very Low Probability	Low	Moderate	High	Very High Probability

25. Kentucky enjoys the distinction of growing the highest quality burley in the world. However, foreign producers have increased the quality of their burley tobacco in recent years. Using the scale below, how probable do you believe it is that burley produced outside the U.S. will be of equivalent quality to Kentucky burley within the next 10 years?

Very Low Probability	Low	Moderate	High	Very High Probability

26. Several potentially important elements of change that could affect the future of burley tobacco are listed below. How much influence or leverage do you think Kentucky's federal and state level policymakers can exercise on these factors? Use the scale below to indicate the degree to which you believe policymakers can affect the course of these factors.

Elements of Potential Change	No Leverage	Very Low Leverage	Low	Medium	High	Very High Leverage
Tax increase on a pack of cigarettes	0	1	2	3	4	5
Tax increase on other tobacco products	0	1	2	3	4	5
Amount of burley leaf used in cigarette production	0	1	2	3	4	5
Amount of *total* leaf used in cigarette production	0	1	2	3	4	5
Total number of cigarette smokers in the U.S.	0	1	2	3	4	5
Cigarettes consumed per smoker (U.S. smokers)	0	1	2	3	4	5
Level of foreign cigarette consumption	0	1	2	3	4	5
Amount of exported unmanufactured leaf	0	1	2	3	4	5
Level of domestic content (cigarettes)	0	1	2	3	4	5
Movement of cigarette production overseas	0	1	2	3	4	5
Amount of U.S. tobacco used in overseas production	0	1	2	3	4	5
Development of extended uses for tobacco	0	1	2	3	4	5

27. Please use the back of this page (or another page) to delineate specific actions you feel policymakers could take in order to exercise leverage on any of the factors listed above -- particularly if you circled "4" or "5" on a factor.

If you have any additional comments or would like to elaborate on any of your answers, they are encouraged and welcomed.

Summary statistics are presented in Table B.1 for the questionnaire results. Please note that questions 1, 4, 10, 12, 17, and 20 are answered with a "Yes" or "No." The value in the "mean column" reflects the number of respondents who indicated "Yes" to the question. Thus, a 96% mean value shown for question 1 indicates that 96% of the respondents answered "Yes" to the question, "Do you think there will be an increase in the federal excise tax on a pack of cigarettes?"

Table B.1
Summary Statistics on Questionnaire Results

Question	Min	Q1	Median	Q3	Mean	Standard Deviation	Coeff. of Variation	Max	n
1					96%	20%	4.7		24
2	$0.00	$0.25	$0.50	$0.75	$0.55	$0.30	1.9	$1.00	24
3	-25.0%	-15.0%	-11.0%	-5.0%	-10.8%	6%	1.7	-1.0%	24
4					50%	51%	1.0		22
5	0.500	0.669	0.750	0.750	0.713	0.078	9.1	0.877	20
6	-7.0%	-4.0%	-3.0%	-2.0%	-3.0%	2%	1.9	0.0%	23
7	-12.5%	-4.8%	-3.0%	-2.1%	-4.0%	3%	1.3	0.0%	16
8	-1.0%	1.0%	1.5%	3.0%	2.2%	2%	1.0	7.5%	19
9	-10.0%	-1.5%	-1.0%	2.0%	-0.6%	4%	0.2	7.5%	21
10					13%	34%	0.4		24
11	25.0%	40.0%	50.0%	53.3%	48.4%	12%	4.2	70.0%	20
12					74%	45%	1.6		23
13a.	250	0	100	175	136	69	2.0	1	15
13b.	0%	16.3%	25%	28.8%	23%	16%	1.4	60%	14
14	-20.0%		0.0%		-0.3%	8%	0.0	22.5%	14
15	-5.0%	0.0%	0.0%	0.0%	1.0%	6%	0.2	22.5%	15
16	-2.0%		0.0%		-0.4%	1%	0.5	0.0%	7
17					5%	21%	0.2		22
18	0.00	0	0.00	0	0.16	0.35	0.4	1.00	21
19	0%		0%		16%	22%	0.7	50%	13
20					59%	50%	1.2		22
21	0.0%	2.4%	3.0%	5.4%	3.9%	3%	1.3	10.0%	16
22	20.0%	30.0%	30.0%	33.0%	32.4%	7%	4.7	50.0%	13
23	$1.75	$2.50	$2.50	$3.50	$3.42	$2.02	1.7	$10.00	16
24			3		2.9	1.4	2.1		24
25			2		2.6	1.1	2.5		24
26a.	1		3.0		3.2	1.2	2.6	5	24
26b.	2		3.0		3.2	1.2	2.7	5	24
26c.	0		2.0		1.9	1.2	1.6	4	24
26d.	0		1.5		1.6	1.3	1.3	4	24
26e.	0		1.3		1.5	1.2	1.2	4	24
26f.	0		1.3		1.6	1.2	1.3	4	24
26g.	0		1.0		1.1	1.1	1.0	4	24
26h.	0		3.0		2.7	1.2	2.2	5	24
26i.	1		3.0		3.3	0.9	3.8	5	24
26j.	1		2.0		2.3	1.0	2.3	4	24
26k.	0		1.0		1.6	1.3	1.2	4	24
26l.	0		2.5		2.6	1.3	2.0	5	26

APPENDIX C
SUPPLEMENTARY TABLE ON COUNTY LEVEL DATA

County level data are presented in Table C.1. Some county data are presented in **bold type**. This indicates that this is a county "at risk" (refer to page 37). A parenthesis indicates a negative number (i.e., (216) = -216).

- Basic Quota 1993 - This is the county's basic burley quota for 1993. Source: *Kentucky Agricultural Statistics, 1992-1993,* prepared by the Kentucky Agricultural Statistics Service.

- Estimated Basic Quota 2003 - This number reflects the "Q2" scenario. Therefore, it shows a 41% decline in the county's 1993 basic quota.

- Tobacco Income Lost - This is the amount of lost quota multiplied by $1.80 per pound. It is used solely for illustrative purposes to give context and meaning to the lost poundage. It does *not* indicate that tobacco will be worth $1.80 per pound for any specified period in the future.

- Potential Tobacco Rebate Funds - These numbers are based on the "Q2" scenario (refer to pages 49-53). The county's portion of the total $630 million tobacco rebate is derived by allocating it proportionately with the county's portion of the state's total burley quota. For instance, Adair County has 1.097% of the state's basic quota (4.458 million pounds out of the state's basic quota of 406.471 million pounds), and it is assumed that it would receive this same percentage of any tobacco rebate. In this example, 1.097% of $630.5 million is about $6.9 million.

- Total Personal Income (1990) 1,000 Residence Adjusted - This is the county level income for 1990, Source: *1993 Kentucky Deskbook of Economic Statistics.*

- Tobacco's Portion of Total Personal Income (est.) - This is Total Personal Income divided by the estimated value of the burley quota in 1993 (basic quota times $1.80). It is used as a comparative measure of tobacco dependence across counties.

- Poverty Rate (persons) - This is the poverty rate as reported in the 1990 census.

Table C.1
Selected County Level Data

County	Basic Quota 1993	Estimated Basic Quota 2003	Tobacco Income Lost	Potential Tobacco Rebate Funds
Adair	4,458,712	2,625,085	$3,300,528	$6,915,811
Allen	3,289,535	1,936,728	$2,435,053	$5,102,326
Anderson	3,239,373	1,907,194	$2,397,921	$5,024,521
Ballard	2,581,689	1,519,980	$1,911,076	$4,004,401
Barren	11,533,941	6,790,656	$8,537,913	$17,890,044
Bath	**6,001,673**	**3,533,510**	**$4,442,693**	**$9,309,064**
Bell	17,504	10,306	$12,957	$27,150
Boone	2,952,601	1,738,356	$2,185,641	$4,579,715
Bourbon	11,195,142	6,591,187	$8,287,119	$17,364,540
Boyd	64,007	37,684	$47,381	$99,280
Boyle	4,424,977	2,605,224	$3,275,556	$6,863,485
Bracken	6,190,978	3,644,964	$4,582,825	$9,602,691
Breathitt	1,231,342	724,958	$911,492	$1,909,908
Breckinridge	6,941,749	4,086,984	$5,138,577	$10,767,195
Bullitt	1,278,615	752,790	$946,485	$1,983,232
Butler	777,145	457,547	$575,276	$1,205,413
Caldwell	1,048,799	617,485	$776,366	$1,626,769
Calloway	485,250	285,693	$359,203	$752,661
Campbell	659,211	388,113	$487,976	$1,022,488
Carlisle	485,426	285,797	$359,333	$752,934
Carroll	3,639,772	2,142,931	$2,694,314	$5,645,571
Carter	3,184,379	1,874,816	$2,357,213	$4,939,221
Casey	**5,679,080**	**3,343,582**	**$4,203,896**	**$8,808,697**
Christian	5,886,663	3,465,798	$4,357,558	$9,130,674
Clark	7,035,663	4,142,276	$5,208,096	$10,912,863
Clay	2,604,869	1,533,628	$1,928,235	$4,040,355
Clinton	**2,217,407**	**1,305,508**	**$1,641,419**	**$3,439,372**
Crittenden	34,862	20,525	$25,806	$54,074
Cumberland	**2,403,304**	**1,414,955**	**$1,779,028**	**$3,727,712**
Daviess	6,633,936	3,905,758	$4,910,721	$10,289,753
Edmonson	1,697,674	999,513	$1,256,690	$2,633,225
Elliott	**2,006,311**	**1,181,224**	**$1,485,157**	**$3,111,945**
Estill	1,500,657	883,518	$1,110,850	$2,327,636
Fayette	11,249,667	6,623,289	$8,327,481	$17,449,113
Fleming	**7,254,162**	**4,270,918**	**$5,369,839**	**$11,251,772**
Floyd	7,866	4,631	$5,823	$12,201
Franklin	5,444,381	3,205,402	$4,030,162	$8,444,660
Fulton	4,725	2,782	$3,498	$7,329
Gallatin	2,089,763	1,230,357	$1,546,931	$3,241,386
Garrard	6,963,703	4,099,909	$5,154,829	$10,801,248
Grant	5,555,706	3,270,945	$4,112,569	$8,617,334
Graves	797,888	469,760	$590,631	$1,237,587
Grayson	3,736,937	2,200,137	$2,766,239	$5,796,281
Green	5,697,315	3,354,318	$4,217,394	$8,836,981
Greenup	1,847,163	1,087,525	$1,367,348	$2,865,094

Table C.1
(continued)

County	Basic Quota 1993	Estimated Basic Quota 2003	Tobacco Income Lost	Potential Tobacco Rebate Funds
Hancock	2,225,366	1,310,194	$1,647,310	$3,451,717
Hardin	4,152,847	2,445,006	$3,074,114	$6,441,390
Harlan	4,502	2,651	$3,333	$6,983
Harrison	8,965,082	5,278,230	$6,636,334	$13,905,543
Hart	**8,456,390**	**4,978,735**	**$6,259,779**	**$13,116,522**
Henderson	764,161	449,903	$565,664	$1,185,273
Henry	9,002,010	5,299,971	$6,663,670	$13,962,821
Hickman	56,366	33,186	$41,725	$87,428
Hopkins	352,454	207,509	$260,901	$546,684
Jackson	**2,983,605**	**1,756,610**	**$2,208,591**	**$4,627,805**
Jefferson	581,185	342,175	$430,218	$901,463
Jessamine	6,778,135	3,990,655	$5,017,463	$10,513,417
Johnson	684,241	402,850	$506,504	$1,061,311
Kenton	1,374,846	809,446	$1,017,719	$2,132,494
Knott	1,026	604	$759	$1,591
Knox	961,539	566,110	$711,772	$1,491,422
Larue	3,058,181	1,800,517	$2,263,795	$4,743,478
Laurel	4,243,239	2,498,225	$3,141,026	$6,581,595
Lawrence	689,854	406,154	$510,659	$1,070,017
Lee	610,711	359,559	$452,074	$947,260
Leslie	116,465	68,569	$86,212	$180,646
Letcher	2,951	1,737	$2,184	$4,577
Lewis	**4,450,066**	**2,619,995**	**$3,294,128**	**$6,902,400**
Lincoln	**6,277,548**	**3,695,933**	**$4,646,908**	**$9,736,968**
Livingston	16,049	9,449	$11,880	$24,893
Logan	3,279,571	1,930,861	$2,427,678	$5,086,871
Lyon	443,666	261,210	$328,420	$688,161
Madison	10,323,474	6,077,989	$7,641,874	$16,012,515
Magoffin	1,708,304	1,005,771	$1,264,559	$2,649,713
Marion	5,278,326	3,107,637	$3,907,241	$8,187,096
Marshall	416,796	245,390	$308,530	$646,483
Martin	1,113	655	$824	$1,726
Mason	8,209,997	4,833,670	$6,077,388	$12,734,347
McCracken	1,079,066	635,305	$798,770	$1,673,716
McCreary	68,150	40,124	$50,448	$105,706
McLean	1,421,346	836,823	$1,052,141	$2,204,619
Meade	1,756,724	1,034,279	$1,300,402	$2,724,816
Menifee	**1,419,689**	**835,848**	**$1,050,914**	**$2,202,049**
Mercer	6,518,549	3,837,823	$4,825,307	$10,110,779
Metcalfe	**5,274,938**	**3,105,642**	**$3,904,733**	**$8,181,841**
Monroe	3,543,284	2,086,123	$2,622,889	$5,495,910
Montgomery	6,258,472	3,684,702	$4,632,787	$9,707,379
Morgan	**3,775,437**	**2,222,804**	**$2,794,739**	**$5,855,998**
Muhlenberg	925,482	544,881	$685,081	$1,435,495
Nelson	4,453,192	2,621,835	$3,296,442	$6,907,249

Table C.1
(continued)

County	Basic Quota 1993	Estimated Basic Quota 2003	Tobacco Income Lost	Potential Tobacco Rebate Funds
Nicholas	5,182,987	3,051,505	$3,836,667	$8,039,218
Ohio	2,524,004	1,486,018	$1,868,375	$3,914,927
Oldham	1,397,132	822,567	$1,034,216	$2,167,061
Owen	7,593,217	4,470,538	$5,620,822	$11,777,673
Owsley	**1,787,627**	**1,052,473**	**$1,323,277**	**$2,772,749**
Pendleton	4,815,139	2,834,933	$3,564,370	$7,468,657
Perry	74,118	43,637	$54,865	$114,963
Pike	0	0	$0	$0
Powell	946,229	557,096	$700,439	$1,467,675
Pulaski	6,400,009	3,768,032	$4,737,558	$9,926,914
Robertson	2,443,290	1,438,497	$1,808,627	$3,789,734
Rockcastle	3,108,566	1,830,181	$2,301,093	$4,821,629
Rowan	1,543,905	908,981	$1,142,864	$2,394,717
Russell	3,265,924	1,922,826	$2,417,576	$5,065,703
Scott	9,973,151	5,871,734	$7,382,550	$15,469,137
Shelby	12,078,212	7,111,098	$8,940,805	$18,734,251
Simpson	1,919,478	1,130,101	$1,420,879	$2,977,260
Spencer	3,988,289	2,348,122	$2,952,301	$6,186,148
Taylor	4,764,438	2,805,083	$3,526,839	$7,390,016
Todd	2,486,382	1,463,868	$1,840,526	$3,856,573
Trigg	1,554,491	915,213	$1,150,700	$2,411,137
Trimble	3,713,654	2,186,429	$2,749,004	$5,760,168
Union	13,203	7,773	$9,773	$20,479
Warren	5,727,037	3,371,817	$4,239,396	$8,883,082
Washington	6,526,124	3,842,283	$4,830,914	$10,122,528
Wayne	2,823,544	1,662,373	$2,090,107	$4,379,537
Webster	305,029	179,587	$225,795	$473,124
Whitley	552,992	325,576	$409,348	$857,734
Wolfe	**1,967,241**	**1,158,221**	**$1,456,235**	**$3,051,345**
Woodford	9,996,321	5,885,376	$7,399,701	$15,505,075
TOTAL	406,471,636	239,315,542	$300,884,611	$630,463,096
Median	2,505,193	1,474,943	$1,889,725	$3,959,664
Mean	3,331,735	1,961,586	$2,507,372	$5,253,859
Standard Deviation	36,627,233	21,564,765	$27,332,140	$57,270,810

Table C.1
(continued)

County	Total Personal Income (1990) 1,000 Residence Adjusted	Tobacco's Portion of Total Personal Income (est.)	Poverty Rate (persons)
Adair	$181,367	4.4%	25.1%
Allen	$170,319	3.5%	24.6%
Anderson	$212,239	2.7%	9.3%
Ballard	$122,889	3.8%	18.5%
Barren	$445,913	4.7%	21.5%
Bath	**$108,803**	**9.9%**	**27.3%**
Bell	$337,459	0.0%	36.2%
Boone	$1,060,928	0.5%	7.4%
Bourbon	$284,855	7.1%	17.5%
Boyd	$859,742	0.0%	16.5%
Boyle	$373,299	2.1%	17.1%
Bracken	$87,349	12.8%	21.4%
Breathitt	$165,101	1.3%	39.5%
Breckinridge	$202,125	6.2%	23.2%
Bullitt	$670,021	0.3%	10.4%
Butler	$128,050	1.1%	23.8%
Caldwell	$161,862	1.2%	19.9%
Calloway	$433,953	0.2%	17.7%
Campbell	$1,346,052	0.1%	11.0%
Carlisle	$66,095	1.3%	17.7%
Carroll	$133,373	4.9%	22.0%
Carter	$252,378	2.3%	26.8%
Casey	**$145,376**	**7.0%**	**29.4%**
Christian	$787,553	1.3%	18.1%
Clark	$435,945	2.9%	17.7%
Clay	$188,828	2.5%	40.2%
Clinton	**$80,984**	**4.9%**	**38.1%**
Crittenden	$102,703	0.1%	18.7%
Cumberland	**$66,965**	**6.5%**	**31.6%**
Daviess	$1,381,716	0.9%	15.4%
Edmonson	$81,864	3.7%	27.0%
Elliott	**$50,888**	**7.1%**	**38.0%**
Estill	$147,025	1.8%	29.0%
Fayette	$4,377,590	0.5%	14.1%
Fleming	**$141,607**	**9.2%**	**25.4%**
Floyd	$545,858	0.0%	31.2%
Franklin	$744,935	1.3%	10.9%
Fulton	$116,509	0.0%	30.3%
Gallatin	$75,350	5.0%	14.3%
Garrard	$154,520	8.1%	18.1%
Grant	$204,477	4.9%	15.1%
Graves	$482,039	0.3%	16.9%
Grayson	$228,345	2.9%	23.8%
Green	$125,862	8.1%	21.6%
Greenup	$514,306	0.6%	17.6%

Table C.1
(continued)
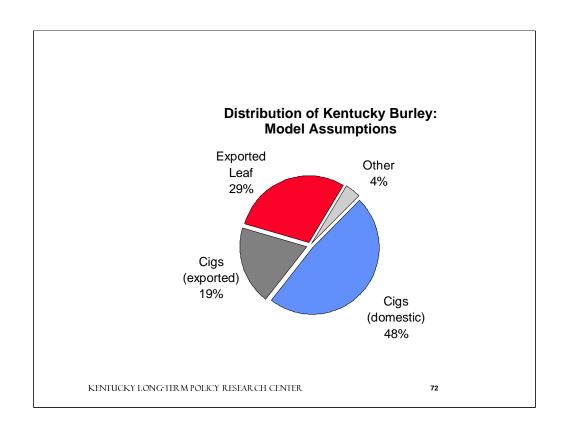
County	Total Personal Income (1990) 1,000 Residence Adjusted	Tobacco's Portion of Total Personal Income (est.)	Poverty Rate (persons)
Hancock	$114,643	3.5%	16.8%
Hardin	$1,193,378	0.6%	13.5%
Harlan	$422,607	0.0%	33.1%
Harrison	$214,349	7.5%	16.9%
Hart	**$163,180**	**9.3%**	**27.1%**
Henderson	$693,411	0.2%	14.6%
Henry	$176,460	9.2%	19.7%
Hickman	$72,590	0.1%	20.1%
Hopkins	$781,825	0.1%	17.2%
Jackson	**$100,384**	**5.3%**	**38.2%**
Jefferson	$12,732,024	0.0%	13.7%
Jessamine	$471,906	2.6%	13.2%
Johnson	$284,559	0.4%	28.7%
Kenton	$2,412,224	0.1%	9.9%
Knott	$164,397	0.0%	40.4%
Knox	$295,262	0.6%	38.9%
Larue	$160,280	3.4%	19.9%
Laurel	$526,408	1.5%	24.8%
Lawrence	$136,697	0.9%	36.0%
Lee	$65,084	1.7%	37.4%
Leslie	$135,244	0.2%	35.6%
Letcher	$293,232	0.0%	31.8%
Lewis	**$136,718**	**5.9%**	**30.7%**
Lincoln	**$207,296**	**5.5%**	**27.2%**
Livingston	$116,947	0.0%	15.5%
Logan	$320,777	1.8%	16.1%
Lyon	$77,814	1.0%	14.3%
Madison	$732,220	2.5%	21.2%
Magoffin	$115,437	2.7%	42.5%
Marion	$204,369	4.6%	25.6%
Marshall	$398,730	0.2%	14.1%
Martin	$150,504	0.0%	35.4%
Mason	$235,686	6.3%	20.3%
McCracken	$1,099,416	0.2%	15.8%
McCreary	$119,582	0.1%	45.5%
McLean	$128,034	2.0%	19.2%
Meade	$277,336	1.1%	12.8%
Menifee	**$41,819**	**6.1%**	**35.0%**
Mercer	$305,177	3.8%	16.7%
Metcalfe	**$94,664**	**10.0%**	**27.9%**
Monroe	$139,075	4.6%	26.9%
Montgomery	$258,505	4.4%	21.0%
Morgan	**$110,550**	**6.1%**	**38.8%**
Muhlenberg	$380,905	0.4%	20.7%
Nelson	$434,227	1.8%	15.1%

Table C.1
(continued)
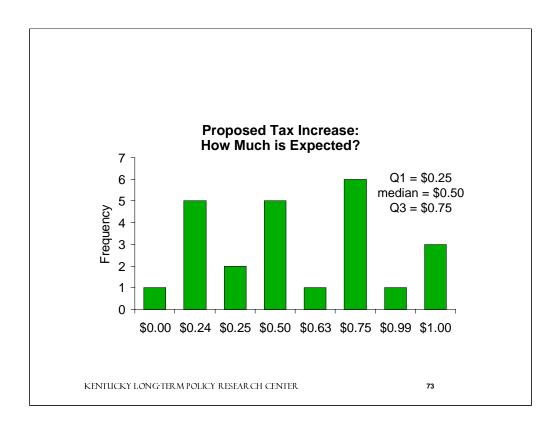
County	Total Personal Income (1990) 1,000 Residence Adjusted	Tobacco's Portion of Total Personal Income (est.)	Poverty Rate (persons)
Nicholas	$89,879	10.4%	22.6%
Ohio	$240,521	1.9%	23.6%
Oldham	$686,883	0.4%	6.3%
Owen	$105,398	13.0%	19.5%
Owsley	**$42,941**	**7.5%**	**52.1%**
Pendleton	$146,230	5.9%	18.9%
Perry	$409,597	0.0%	32.1%
Pike	$947,999	0.0%	25.4%
Powell	$115,706	1.5%	26.2%
Pulaski	$641,504	1.8%	22.7%
Robertson	$21,158	20.8%	24.8%
Rockcastle	$157,189	3.6%	30.7%
Rowan	$212,327	1.3%	28.9%
Russell	$187,836	3.1%	25.6%
Scott	$431,439	4.2%	14.5%
Shelby	$426,411	5.1%	14.2%
Simpson	$200,808	1.7%	15.5%
Spencer	$87,856	8.2%	19.2%
Taylor	$280,291	3.1%	19.5%
Todd	$126,274	3.5%	18.8%
Trigg	$137,049	2.0%	18.0%
Trimble	$85,875	7.8%	16.3%
Union	$245,188	0.0%	22.1%
Warren	$1,130,834	0.9%	17.5%
Washington	$136,584	8.6%	18.8%
Wayne	$166,670	3.0%	37.3%
Webster	$235,091	0.2%	16.5%
Whitley	$412,874	0.2%	33.0%
Wolfe	**$58,422**	**6.1%**	**44.3%**
Woodford	$471,196	3.8%	7.9%
TOTAL	$55,319,379	n.a.	n.a.
Median	$201,467	2.2%	21.1%
Mean	$460,995	3.3%	23.3%
Standard Deviation	$5,158,197	3.5%	9.3%

APPENDIX D
MODEL ASSUMPTIONS AND QUESTIONNAIRE RESULTS
IN THEIR HISTORICAL CONTEXT

In this section we present a series of slides that illustrate some model assumptions and questionnaire results.

**Distribution of Kentucky Burley:
Model Assumptions**

Exported
Leaf
29%

Other
4%

Cigs
(exported)
19%

Cigs
(domestic)
48%
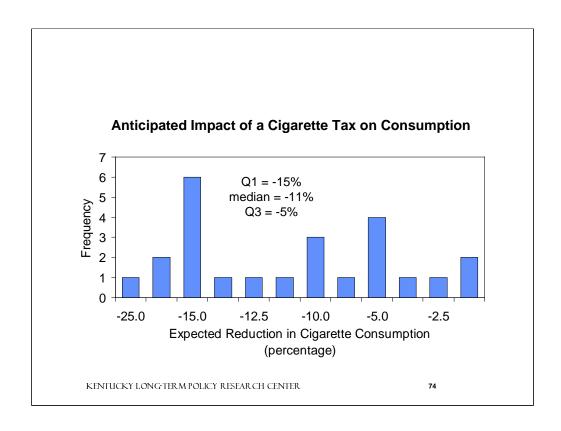
This pie charts shows the assumed distribution of Kentucky's burley. Refer to Appendix E, cells B10:B13.

**Proposed Tax Increase:
How Much is Expected?**

Q1 = $0.25
median = $0.50
Q3 = $0.75

This chart illustrates the expert response to question 2 of the expert questionnaire: "If there is an increase in the federal excise tax on a pack of cigarettes, how much do you think this increase will be?" (Refer to Appendix A, "Tobacco Questionnaire, Question 2.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 2.

This chart lists the first quartile (Q1) value ($0.25), the median ($0.50), and the third quartile (Q3) value ($0.75).

Anticipated Impact of a Cigarette Tax on Consumption

Q1 = -15%
median = -11%
Q3 = -5%

Frequency

Expected Reduction in Cigarette Consumption
(percentage)

This chart illustrates the expert response to the question: "What percentage decrease in cigarette consumption do you anticipate as a result of this tax increase?" (Refer to Appendix A, "Tobacco Questionnaire, Question 3.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 3.

This chart lists the first quartile (Q1) value (-15%), the median (-11%), and the third quartile (Q3) value (-5%).

Americans Who Smoke: Probable Rates of Change

This chart illustrates the expert response to the question: "What do you think the average annual rate of change in total domestic cigarette consumption will be over the next 10 years (percent)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 6.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 6.

This chart lists the first quartile (Q1) value (-2%), the median (-3%), and the third quartile (Q3) value (-4%).

To place these expert opinions in context, the chart also illustrates the predicted slope based on a bivariate regression between the number of Americans who smoke (in the last month, 12 years and older) and the year (1982 to 1992).

Source of the historical data: *Preliminary Estimates From The 1992 National Household Survey On Drug Abuse*, U.S. Department of Health and Human Services, Advance Report Number 3, June 1993.

Declines Expected in Cigarettes Consumed per Smoker
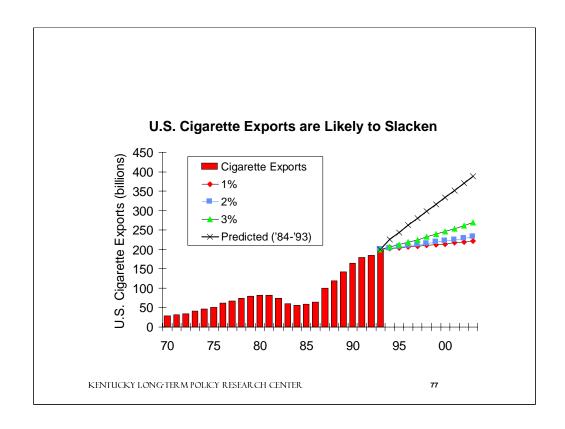
This chart illustrates the expert response to the question: "In the U.S., the average smoker consumes about 7,500 cigarettes annually. What do you think the average annual rate of change will be over the next 10 years (percent)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 7.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 7.
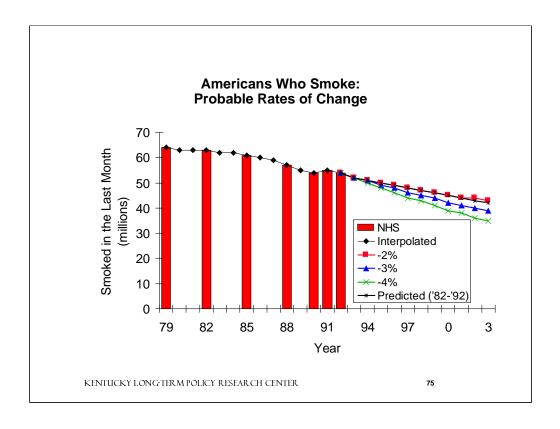
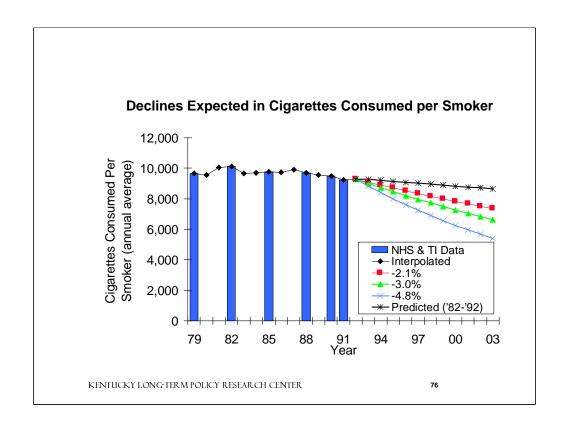This chart lists the first quartile (Q1) value (-2.1%), the median (-3%), and the third quartile (Q3) value (-4.8%).

To place these expert opinions in context, the chart also illustrates the predicted slope based on a bivariate regression between the average number of cigarettes consumed by smokers in the U.S. and the year (1982 to 1992). It is interesting that the experts are expecting a much more precipitous decline than what would be expected given the trend for the last ten years.

Source of the historical data: *Preliminary Estimates From The 1992 National Household Survey On Drug Abuse*, U.S. Department of Health and Human Services, Advance Report Number 3, June 1993, and *U.S. Tobacco Statistics, 1935-92,* United States Department of Agriculture, Statistical Bulletin Number 869, by Laverne Creek, Tom Capehart, and Verner Grise.
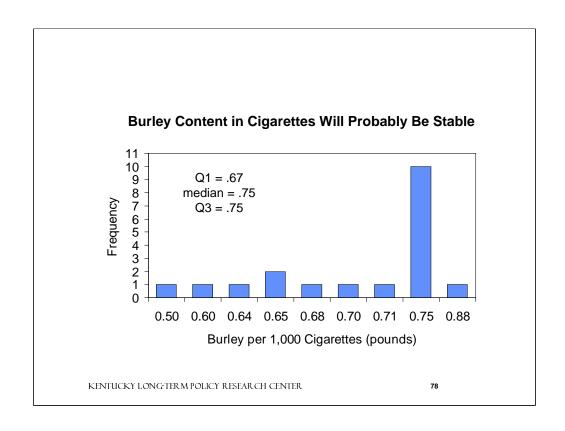
U.S. Cigarette Exports are Likely to Slacken

This chart illustrates the expert response to the question: "What do you think the average annual rate of change in foreign cigarette consumption will be over the next 10 years (percent)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 8.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 8.

This chart lists the first quartile (Q1) value (1%), the median (1.5%), and the third quartile (Q3) value (3%).

To place these expert opinions in context, the chart also illustrates the predicted slope based on a bivariate regression between the average number of cigarettes exported for foreign consumption and the year (1984 to 1993).

Source of the historical data: Tobacco Situation and Outlook Report, TS-220, September 1992.

Burley Content in Cigarettes Will Probably Be Stable

Q1 = .67
median = .75
Q3 = .75

Frequency (y-axis: 0 to 11)

Burley per 1,000 Cigarettes (pounds)

0.50 0.60 0.64 0.65 0.68 0.70 0.71 0.75 0.88

This chart illustrates the expert response to the question: "Total burley currently accounts for about 0.75 pounds (or about 38.5%) of the total tobacco leaf (FSW) used per 1,000 cigarettes manufactured. Do you think the amount of burley used per 1,000 cigarettes will be different 10 years from now? -- If yes, how much burley do you think will be used per 1,000 cigarettes?" (Refer to Appendix A, "Tobacco Questionnaire, Questions 4 & 5.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 5.

This chart lists the first quartile (Q1) value (.67), the median (.75), and the third quartile (Q3) value (.75).

No Changes are Expected in Cigarette Size & Extended Uses
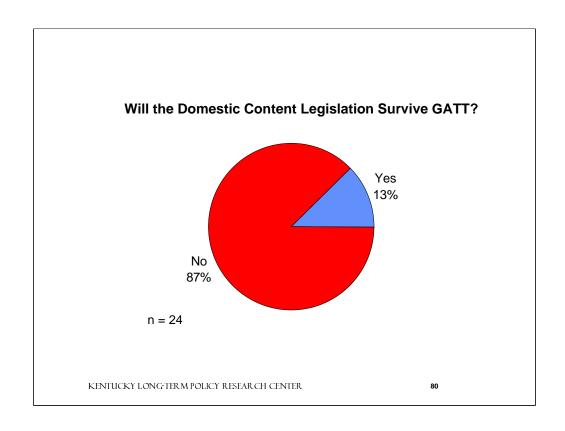
- **Cigarette size**
  - unlikely to change
    - » Q1 = 0, median = 0, Q3 = 0
- **Extended uses for tobacco**
  - this is the wild card, but it is also unlikely to change over the next 10 years
    - » Q1 = 0, median = 0, Q3 = 0

KENTUCKY LONG-TERM POLICY RESEARCH CENTER   **79**

This chart illustrates the expert response to two separate questions:

• "What impact, if any, will the domestic content requirement have on the total amount of leaf used per 1,000 cigarettes?" (Refer to Appendix A, "Tobacco Questionnaire, Question 15.) The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 15. This chart lists the first quartile (Q1) value (0), the median (0), and the third quartile (Q3) value (0).

• "How much additional demand (for burley tobacco) do you think will be generated as a result of extended uses for tobacco (pounds)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 18.) The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 18. This chart lists the first quartile (Q1) value (0), the median (0), and the third quartile (Q3) value (0).

Will the Domestic Content Legislation Survive GATT?

Yes
13%

No
87%

n = 24

This chart illustrates the expert response to the question: "In light of the General Agreement on Tariffs and Trade (GATT), do you think that the current domestic content legislation (75%) will remain intact?" (Refer to Appendix A, "Tobacco Questionnaire, Question 10.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 10.

This chart shows that 87% of the experts feel that it will not survive.

The Real Questions: How Long Will It Survive & Then What?

- **Domestic content legislation will be reviewed by a GATT committee this summer**
  - expected to be found in violation of GATT
- **How long will it take to phase out?**
  - 1 year? 3 years? 5 years?
- **Where will domestic content go in the absence of this legislation?**
  - this question was asked of the tobacco experts (n=19)
    - » Q1 = 40%, median = 50%, Q3 = 53%
    - » minimum = 25%, maximum = 70%

KENTUCKY LONG-TERM POLICY RESEARCH CENTER   81
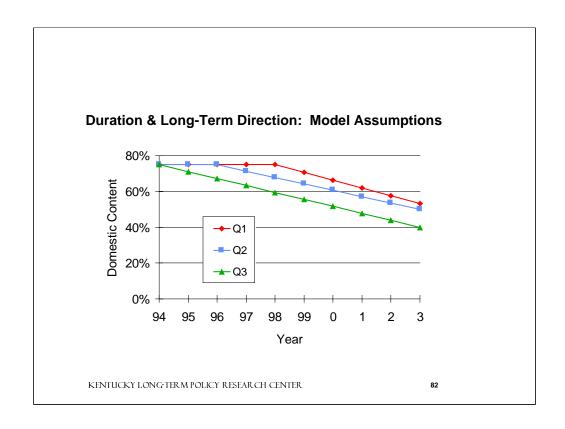
The real questions center on how long will it survive and what happens after its demise. Some believe that Article 28 of GATT could be used to limit leaf imports at a specified level and would be legal within the GATT framework. This *could* result in a 70/30 distribution (instead of 75%/25%), but the final outcome of the legislation remains to be seen.

A legitimate question is "if it is struck down, as 87% of the surveyed experts believe, how long will it take to phase out?" The assumptions used in the three scenarios generated in this analysis are 1 year (worst probable), 3 years (most probable), and 5 years (best probable).
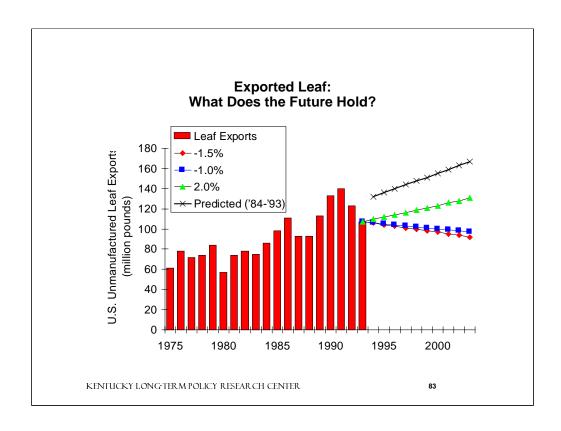
Finally, where will domestic content go in the absence of this legislation? The experts were asked: "What do you believe the percentage of domestic content in cigarettes would be in ten years if there was not a domestic content requirement?" (Refer to Appendix A, "Tobacco Questionnaire, Question 11.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 11.

This chart lists the first quartile (Q1) value (40%), the median (50%), and the third quartile (Q3) value (53%).

Duration & Long-Term Direction: Model Assumptions

This chart illustrates the expert response to the questions about the longevity of the domestic content legislation and where it might go in the absence of the legislation.
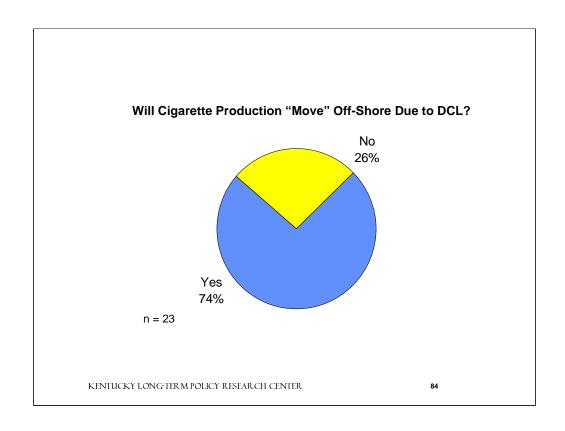
**Exported Leaf:
What Does the Future Hold?**

This chart illustrates the expert response to the question: "What do you think the average annual rate of change in exported unmanufactured leaf will be over the next 10 years (percent)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 9.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 9.

This chart lists the first quartile (Q1) value (-1.5%), the median (-1%), and the third quartile (Q3) value (2%).

To place these expert opinions in context, the chart also illustrates the predicted slope based on a bivariate regression between leaf exports and the year (1984 to 1993).
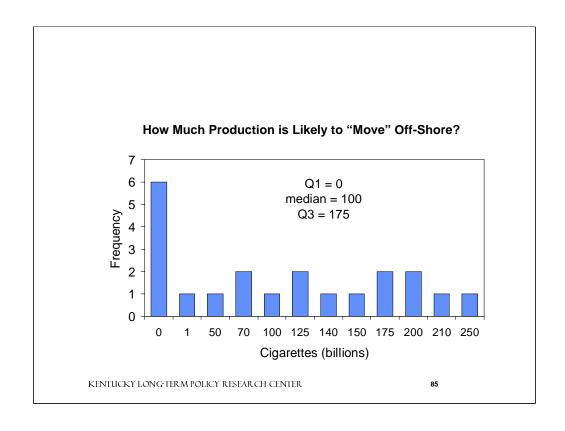
Source of the historical data: Tobacco Situation and Outlook Report, TS-220, September 1992.

Will Cigarette Production "Move" Off-Shore Due to DCL?

No
26%

Yes
74%

n = 23

Some have suggested that the cigarette manufacturers will transfer some cigarette production "off-shore" to escape the requirements of the legislation.[20] This chart illustrates the expert response to the question: "Do you think that the cigarette manufacturers will move production overseas to escape the requirements of the (domestic content) legislation?" (Refer to Appendix A, "Tobacco Questionnaire, Question 12.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 12.

This chart shows that 74% of the surveyed experts feel that the cigarette manufacturers will move operations "off-shore." This is extremely important for future burley quotas because most believe that significantly less U.S. grown tobacco will be used in these cigarettes.

How Much Production is Likely to "Move" Off-Shore?

Q1 = 0
median = 100
Q3 = 175

Frequency (y-axis: 0–7)

Cigarettes (billions) (x-axis: 0, 1, 50, 70, 100, 125, 140, 150, 175, 200, 210, 250)

If some cigarette manufacturing is moved "off-shore," how much is likely to be moved? Accordingly, this chart provides the expert response to the question: "How much production do you think will be moved outside the U.S. over the next 10 years (in terms of numbers of cigarettes)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 13a.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 13a.

This chart lists the first quartile (Q1) value (0), the median (100), and the third quartile (Q3) value (175).

How Much U.S. Leaf Will Be in These Cigarettes?

Q1 = 16%
median = 25%
Q3 = 29%

As previously indicated, most believe that the cigarettes produced "off-shore" will use less U.S. grown tobacco than would be otherwise used in manufacturing in the United States. This chart presents the expert response to the question: "Compared to the amount of U.S. leaf that is used currently in the production of these cigarettes (about 60%), how much U.S. leaf will be used if production is moved overseas (percent)?" (Refer to Appendix A, "Tobacco Questionnaire, Question 13b.)

The summary statistics derived from the expert response are listed in Appendix B, Table B.1, "Summary Statistics on Questionnaire Results," Question 13b.

This chart lists the first quartile (Q1) value (16%), the median (25%), and the third quartile (Q3) value (29%).

APPENDIX E
QUANTITATIVE MODEL USED TO GENERATE SCENARIOS

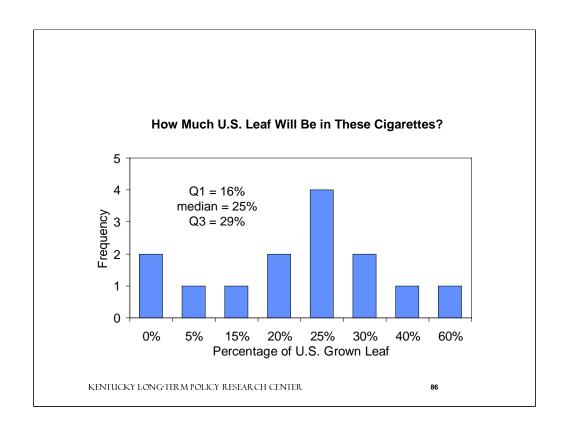The model used to generate the alternative scenarios is displayed in Appendix E. The "most probable" scenario is presented in this example. Some numbers appear in **bold**. These are parameters derived from the expert questionnaire.

- Cells B10:B13 reflect the assumed distribution of Kentucky's burley (Appendix D, p. 73).
- Cells D18:M18 show an assumed 11% decline in consumption occurring as result of a tax increase (for each of the years examined, see pp. 29 & 75).
- Cells D19:M19 reveal how taxes are expected to impact other tobacco products such as snuff, cigars, and pipe tobacco. It is assumed that a similar negative impact on consumption will occur. Accordingly, there is an 11% decline in consumption of "other," which is reflected ultimately in cells C13:M13.
- Cells D20:M20 show an annual rate of change of -3% in the number of Americans who smoke (refer to p. 76).
- Cells D22:M22 indicate the annual rate of change of -3% in the annual rate of change in the numbers of cigarettes consumed by smokers (see p. 77).
- Cells D26:M26 illustrate the expectation of 1.5% for the annual rate of change in cigarette exports (see p. 78).
- Cells D27:M27 reflect the annual rate of movement necessary to transfer 100 billion cigarettes (see cell N30) off-shore from 1993 to 2003. The base line is 200 billion cigarettes (cell C29).
- Cells D28:M28 show the percentage of "previously" used (domestically grown) leaf in these transferred cigarettes. The number in this cell range is 41.7%, which is equal to 25% "U.S. content" (as opposed to 60%) in these cigarettes.
- Cells D32:M32 reflect the expert consensus that cigarette size will likely remain unchanged (refer to p. 80).
- Cells D36:M36 illustrate how the burley content in cigarettes will probably be stable at .75 pounds (FSW) per 1,000 cigarettes (see p. 79).
- Cells C41:M41 and cells C46:M46 provide the domestic content for cigarettes manufactured in the United States. The base line value is 60% (cells C41 & C46). Then the legislated domestic content percentage of 75% is reflected for a three year period (refer to pp. 81-82). After this three year period, domestic content begins a gradual descent to 50% (cells M41 & M46) as evidenced by the expert consensus (refer to p. 82-83).
- Cells C51:M51 show the domestic content of the cigarettes that have been moved "off-shore."
- Cells D55:M55 demonstrate where exported leaf is likely to travel at an annual rate of change of -1.0% (refer to p. 84).
- Cells D58:M58 reflect a 0 to 1 million pound increase from 1993 to 2003 in the amount of tobacco required to fulfill the need generated by extended uses for tobacco.
- Cells C62:M92 give the pounds and percentages for the types of tobacco used in cigarette production. The percentages reflected in cells C89:M92 are imposed on all three categories of cigarettes: 1) cigarettes manufactured in the U.S. and consumed domestically; 2) cigarettes produced in the U.S. and consumed by foreigners; and 3) cigarettes moved "off-shore" and consumed by foreigners.

Table E.1
Quantitative Model Used to Generate Alternative Scenarios

Scenario Q2													
INITIAL CONDITIONS													
U.S. basic quota for burley tobacco in 1993 (million lbs.)	**603**												
KY basic quota for burley tobacco in 1993 (million lbs.)	**406**												
KY basic quota for dark tobaccos in 1993 (million lbs.)	**26**												
Burley as a percentage of Kentucky's total tobacco.	94.0%												

DISTRIBUTION OF KY BURLEY (1993 & Projected Values)	Percent	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Percentage Change
Cigarettes (domestically produced/domestically consumed)	**48%**	195.1	218.7	183.2	172.3	155.9	140.9	127.1	114.4	102.8	92.1	82.4	-57.8%
Cigarettes (domestically produced/non-domestic consumption)	**19%**	77.2	90.4	86.2	82.2	75.5	69.2	63.3	57.9	52.8	48.1	43.6	-43.5%
Exported unmanufactured leaf.	**29%**	117.9	116.7	115.5	114.4	113.2	112.1	111.0	109.9	108.8	107.7	106.6	-9.6%
Burley used for other products & exported "cut rag"	**4%**	16.3	16.3	14.5	12.9	11.5	10.2	9.1	8.1	7.2	6.4	6.7	-58.8%
TOTAL	100%	406.5	442.1	399.3	381.8	356.1	332.4	310.5	290.2	271.5	254.3	239.3	-41.1%

	Baseline 1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Percentage Change
Impact of the proposed cigarette tax increase.	n.a.	**0.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	
Excise tax on other tobacco products.	n.a.	**0.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	**-11.0%**	
Projected average annual change in the number of Americans who smoke.		**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	
Baseline (1994) & projected number of Americans who smoke (in millions)	**54**	52.27524	50.71	49.19	47.710200	46.28	44.89	43.54	42.24	40.97	39.74	-26.3%
Projected average annual change in the average cig. consumption among SMOKERS.		**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	**-3.0%**	
Average annual consumption among smokers (cigarettes)	9,240.7036	8,963.4825	8,695	8,434	8,180.7285	7,935	7,697	7,466	7,242	7,025	6,814	-26.3%
Average annual consumption among smokers (packs per day)	1.26	1.23	1.19	1.15	1.12	1.09	1.05	1.02	0.99	0.96	0.93	-26.3%
Baseline (1994) & projected cigarettes consumed by Americans (in billions)	**498.000**	468.5682	392.37948	369.18985	347.37073	327	308	289	272	256	241	-51.6%
Cigarette exported for foreign consumption (annual percentage change)	n.a.	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	**1.5%**	
Annual rate of movement "off-shore."		**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	**-6.0%**	
Percentage of previously used leaf.		**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	**41.7%**	
U.S. produced cigarettes consumed by foreigners (gross)	**200**	203	194	185	176	168	160	153	146	139	132	
Cigarette production moved off-shore		(12)	(12)	(11)	(11)	(10)	(10)	(9)	(9)	(8)	(8)	(100.0)
Cigarettes consumed by foreigners that are produced in the U.S. (net)	200	191	182	173	165	158	150	143	137	131	124	-37.8%
Percentage change in cigarette size (e.g., tobacco displaced by stem, filter, etc.)	n.a.	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	
Total Farm-Sales-Weight (FSW) lbs. per 1,000 cigarettes	1.95	1.95	1.95	1.95	1.9500000	1.95	1.95	1.95	1.95	1.95	1.95	0.0%
Leaf distribution in cigarettes.												
Flue-cured (FSW lbs. per 1,000 cigarettes)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.0%
Burley (FSW lbs. per 1,000 cigarettes)	**0.75**	**0.750**	**0.750**	**0.750**	**0.750**	**0.750**	**0.750**	**0.750**	**0.750**	**0.750**	**0.75**	**0.0%**
Maryland (FSW lbs. per 1,000 cigarettes)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.0%
Oriental (FSW lbs. per 1,000 cigarettes)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Domestic Content (U.S. Consumed Cigarettes)												
Domestic content of cigarettes manufactured in the U.S. (percentage)	**60%**	**75%**	**75%**	**75%**	**71%**	**68%**	**64%**	**61%**	**57%**	**54%**	**50%**	
Total FSW of domestic tobacco (mil. lbs.)	583	685	574	540	484	432	386	343	303	268	235	
Total FSW of domestic burley tobacco (mil. lbs.)	247.3	277.2	232.1	218.4	197.6	178.6	161.0	145.0	130.2	116.7	104.4	
Percentage change		12%	-16%	-6%	-10%	-10%	-10%	-10%	-10%	-10%	-11%	
Domestic Content (Foreign Consumed Cigarettes)												
Domestic content of cigarettes manufactured in the U.S. (percentage)	**60%**	**75%**	**75%**	**75%**	**71%**	**68%**	**64%**	**61%**	**57%**	**54%**	**50%**	
Total FSW of domestic tobacco (mil. lbs.)	234	279	266	254	230	209	189	170	152	136	121	
Total FSW of domestic burley tobacco (mil. lbs.)	99.3	116.2	110.8	105.7	97.0	89.0	81.5	74.4	67.9	61.8	56.1	
Percentage change		17%	-5%	-5%	-8%	-8%	-8%	-9%	-9%	-9%	-9%	

Table E.1
Quantitative Model Used to Generate Alternative Scenarios

Domestic Content (Cigarettes that were moved overseas)												
Domestic content of cigarettes manufactured in the U.S. (percentage)		60%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
Total FSW of domestic tobacco (mil. lbs.)			5.98	5.71	5.44	5.19	4.95	4.72	4.50	4.29	4.09	3.90	
Total FSW of domestic burley tobacco (mil. lbs.)			*3.4*	*3.2*	*3.1*	*2.9*	*2.8*	*2.7*	*2.5*	*2.4*	*2.3*	*2.2*	
Unmanufactured leaf exports (percentage change)			**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	**-1.0%**	
Unmanufactured leaf exports (million lbs.)		117.9	116.7	115.5	114.4	113.2	112.1	111.0	109.9	108.8	107.7	106.6	-9.6%
Extended Uses: Projected total (from all sources) increase over current (1993) usage (mil. lbs.)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.00**	
TOTAL TOBACCO USED FOR DOMESTIC CONSUMPTION (cigarettes)		971.1	913.7	765.1	719.9	677.4	637.3	599.7	564.2	530.9	499.5	470.0	
DOMESTIC TOBACCO		582.7	685.3	573.9	539.9	483.8	432.5	385.5	342.6	303.4	267.6	235.0	
Flue-cured		297.3	327.7	274.4	258.2	234.5	212.7	192.6	174.2	157.2	141.7	127.4	
Burley		247.3	277.2	232.1	218.4	197.6	178.6	161.0	145.0	130.2	116.7	104.4	
Maryland		14.9	14.1	11.8	11.1	10.4	9.8	9.2	8.7	8.2	7.7	7.2	
FOREIGN TOBACCO		388.4	228.4	191.3	180.0	193.5	204.9	214.2	221.7	227.5	231.9	235.0	
Flue-cured		136.0	79.9	66.9	63.0	67.7	71.7	75.0	77.6	79.6	81.2	82.2	
Burley		126.2	74.2	62.2	58.5	62.9	66.6	69.6	72.0	73.9	75.4	76.4	
Oriental		126.2	74.2	62.2	58.5	62.9	66.6	69.6	72.0	73.9	75.4	76.4	
TOTAL TOBACCO USED FOR FOREIGN CONSUMPTION (cigarettes)		390.0	371.9	354.7	338.3	322.6	307.7	293.4	279.8	266.8	254.5	242.7	
DOMESTIC TOBACCO		234.0	278.9	266.0	253.7	230.4	208.8	188.6	169.9	152.5	136.3	121.3	
Flue-cured		119.4	133.4	127.2	121.3	111.7	102.7	94.2	86.4	79.0	72.2	65.8	
Burley		99.3	112.8	107.6	102.6	94.1	86.2	78.8	71.9	65.5	59.5	53.9	
Maryland		6.0	5.7	5.5	5.2	5.0	4.7	4.5	4.3	4.1	3.9	3.7	
FOREIGN TOBACCO		156.0	93.0	88.7	84.6	92.2	98.9	104.8	109.9	114.4	118.2	121.3	
Flue-cured		54.6	32.5	31.0	29.6	32.3	34.6	36.7	38.5	40.0	41.4	42.5	
Burley		50.7	30.2	28.8	27.5	30.0	32.1	34.1	35.7	37.2	38.4	39.4	
Oriental		50.7	30.2	28.8	27.5	30.0	32.1	34.1	35.7	37.2	38.4	39.4	
TOTAL TOBACCO USED FOR BLENDED CIGARETTES IN OFF-SHORE PRODUCTION			23.9	22.8	21.8	20.7	19.8	18.9	18.0	17.2	16.4	15.6	
DOMESTIC TOBACCO			6.0	5.7	5.4	5.2	4.9	4.7	4.5	4.3	4.1	3.9	
Flue-cured			4.4	4.2	4.0	3.8	3.6	3.5	3.3	3.2	3.0	2.9	
Burley			3.4	3.2	3.1	2.9	2.8	2.7	2.5	2.4	2.3	2.2	
Maryland			0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	
FOREIGN TOBACCO			17.9	17.1	16.3	15.6	14.8	14.1	13.5	12.9	12.3	11.7	
Flue-cured			6.3	6.0	5.7	5.4	5.2	5.0	4.7	4.5	4.3	4.1	
Burley			5.8	5.6	5.3	5.1	4.8	4.6	4.4	4.2	4.0	3.8	
Oriental			5.8	5.6	5.3	5.1	4.8	4.6	4.4	4.2	4.0	3.8	
Flue-cured (percentage)		44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%	
Burley (percentage)		38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%	
Maryland (percentage)		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	
Oriental (percentage)		15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	15.4%	

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